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INSTITUTION NOTICES.

MEMBERS.

Twenty-two Life and ninety-four Annual Members joined the Institution during the first three months of the year. Sixteen Life and twenty-five Annual Members died, and sixteen Annual Members withdrew their names. This leaves a nett increase of six Life and fifty-three Annual, or a total of fifty-nine Members.

MUSEUM.

By authority of the Secretary of State for the Colonies, King Prempeh's Crown and other interesting Ashanti curiosities have been lent for exhibition in the Museum for two months.

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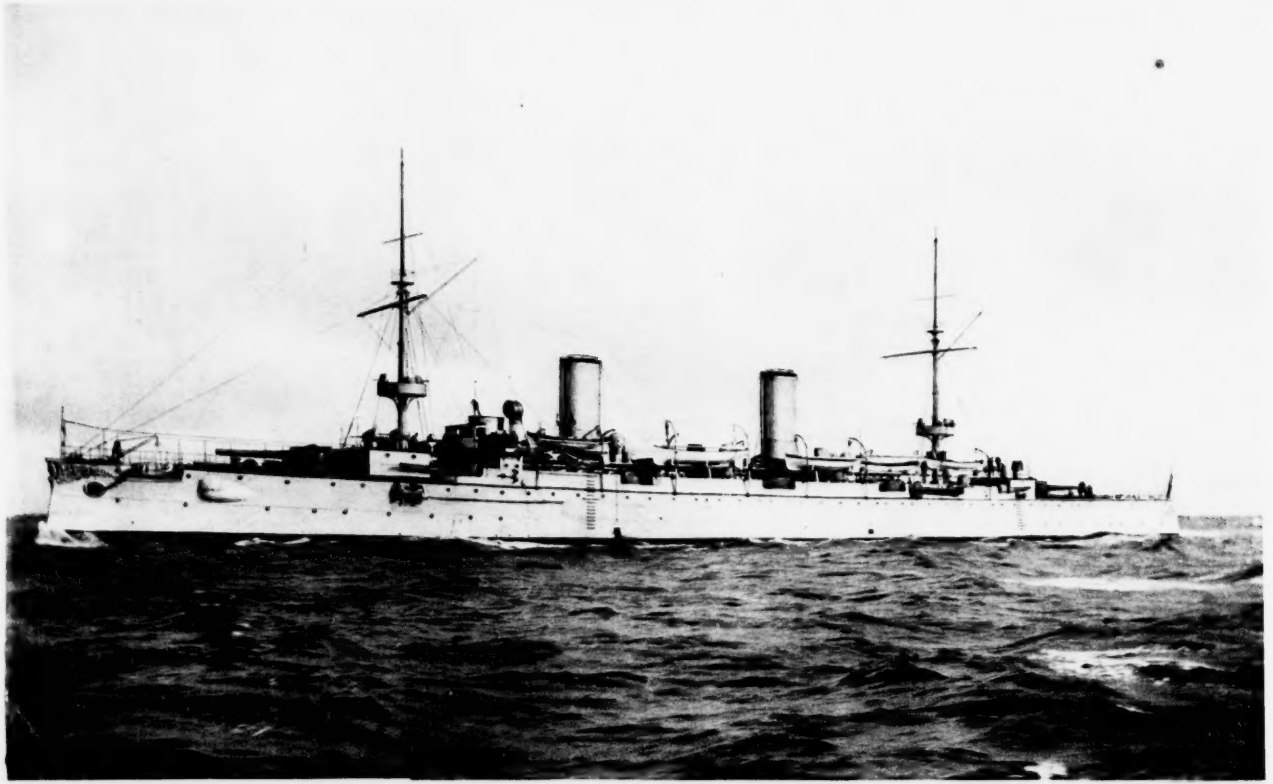

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SEE NAVAL NOTES, Page 458.

The new Argentine first-class Cruiser "BUENOS-AIRES," 4,740 tons, 17,000-I.H.P.

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Officers wishing to take part in the Discussion on the "Naval Prize Essay," Friday, Ist May, can receive a copy of Captain Rose's, R.M.A., Essay (specially recommended by the Referees), on application to the Editor the week before the Discussion.

EXTRA LECTURE.

On 24th APRIL FRIDAY at 3.30 p.m.

"The Convention of Geneva and the Care of the Sick and Wounded in War." J. Furley, Esq.

Chairman:

The Rt. Hon. Viscount Knutsford, G.C.M.G.

THE JOURNAL
OF THE
ROYAL UNITED SERVICE INSTITUTION.

VOL. XL. APRIL, 1896. No. 218.

[*Authors alone are responsible for the contents of their respective Papers.*]

GOLD MEDAL PRIZE ESSAY.

Subject:

"IN VIEW OF THE CHANGES WHICH HAVE TAKEN PLACE IN THE COMPOSITION OF FLEETS DURING THE PRESENT CENTURY, WHAT SYSTEM OF ENTRY, TRAINING, AND DISTRIBUTION IS BEST CALCULATED TO ENSURE AN EFFICIENT BODY OF OFFICERS AND MEN OF ALL BRANCHES, FOR A PEACE AND WAR ESTABLISHMENT?"

By Commander J. HONNER, R.N.

EFFICIENCY AND ECONOMY.

THE changes which have taken place during the past ten years in the construction of our ships, whether battle-ships or gun-vessels, have been so drastic, that a review of the means formerly adopted for officering and manning the fleet will help us little in solving the problem of how to meet the needs of the present, with that due regard to economy so necessary in formulating any scheme for increasing the *personnel* which would have the least chance of becoming a practical fact; but we may still pay some regard to bygone times, though more with a view to learn what cannot now be done, than with any hope that the method then employed will help us in solving the present problem.

When ships used steam as an auxiliary to sail power, a seaman was worth his full value as such; moreover, the fighting weapons employed were of so simple a nature (viewed in the light of the present) that a very small amount of training was sufficient to convert the seaman pure and simple into a "man-of-war's man," capable of performing any of the duties of a fighting ship such as they then were. Similarly circumstanced, in so far as gunnery training was concerned, were those men recruited direct from the shore, and it may be surmised that sufficient seamen were forthcoming to work the ship until the newly-entered landsmen had acquired enough knowledge to take their part in the all-round duties of the vessel. The author was much impressed by the following anecdote as showing the adaptability of landsmen to rapidly acquire sufficient knowledge to become fair seamen:—A master of a sailing-ship stated that, having become short-handed in a British foreign port, he entered five

landsmen, who afterwards proved to have been deserters from a well-known Highland regiment; these, towards the latter part of a voyage occupying four months, were as efficient seamen as any he had had with him in the ship; but here let it be noted that these men had previously been accustomed to discipline and implicit obedience to orders.

It has been pointed out in recent discussions on the subject of manning the fleet, that during the American Civil War the *personnel* of the American Navy increased in four years by something like 44,000 men; and that these men did good service, and were equal to the calls made upon them, history shows to be a fact; but, whilst thinking that the adaptability of men is the same as ever it was, leave must be taken to express an earnest conviction that the calls on adaptability have so much increased that, without a prolonged period of training, it will no longer respond effectually to them.

Vice-Admiral the Hon. Sir Edward Fremantle, in his lecture on the training of our seamen (delivered on 12th February, 1892), sums up the requirements for a modern man-of-war's man as follows:—

1. Habit of a sea life, sea legs, sea stomach, etc.
2. Physique, activity, hardness, power to stand considerable changes of climate, and of enduring prolonged spells of exceptionally hard work.
3. Efficiency in boat work, anchor work, and general seamanlike knowledge of the day.
4. Efficiency in gunnery and torpedo work of all descriptions.
5. Education, intelligence, trustworthiness.
6. Alertness, readiness of resource, quickness of decision; in fact, the many qualities which are included in the expressive word "smartness."
7. Knowledge of stoking and work in the engine-room.

Implied in these, but not definitely stated, is a most important requirement, viz:—

8. Habit of implicit obedience to command, and in fact that self-forgetfulness and subjection to rule which constitute discipline.

Such is the high standard required for the crews of our fleet, if we would with confidence meet our enemies; let not over-confidence in the capacity of Englishmen lead us to imagine that anything inferior will do, but let us bear in mind, as a warning, those words of Sir Cloudesley Shovel written nearly two centuries ago: "The misfortune and vice of our country is to believe ourselves better than other men."

It will be convenient now to take in detail the various ranks and ratings, discussing the numbers required, numbers and fitness of men available, and suggestions how the deficiencies or unfitness can be cured.

Seamen.

It is difficult to obtain, without access to confidential documents, the *actual* numbers required to man the fleet, according to the Admiralty scheme of complements (which, it must be pointed out in passing, are the

very least that will provide crews for the guns, men for ammunition parties, and the many miscellaneous stations to be found in the Quarter Bill), but it is thought that the numbers given here are not very far wrong :—

Seamen Branch.

Including in the term all ratings except stokers and Marines ..	55,556	55,556
Available men of the Regular Service	41,297[1]	45,297[2]
Deficiency	14,259	10,259

The pensioner reserve, numbering about 5,000 men, might be included in the numbers available ; but as no allowance has been made for men in hospitals, etc., it has been thought fairer to omit them from the numerical strength.

It will be seen, therefore, that taking into account the seamen of the Regular Service, who may be said, without fear of contradiction, to fulfil all the requirements previously set forth, that there remains a deficiency of some 14,000 men of the seaman branch required to man the fleet.

To meet this deficiency, we have the Royal Naval Reserve, numbering :—

First Class	10,800
Second Class	10,600
Total	21,400

Various estimates have been made as to the numbers of the Naval Reserve which would be immediately available for service ; these vary from two-thirds of the total Force to one-half. Taking the most optimistic view, there would be 14,000 men to supply an equal deficiency.

What, on the outbreak of war, is the plan for manning the fleet ? Supposing that it were possible to distribute the Naval Reserve throughout the whole fleet, three-fourths of the seamen element of a crew would be composed of Regular Service men, and one-fourth Naval Reserve ; but such a distribution and re-arrangement of crews would be difficult, if not impossible, to carry out in the face of impending and probably (for recent events show that hostilities may take place before a declaration of war is made) actual hostilities. And it must be borne in mind that such a break up of the crew of a commissioned ship would be most demoralising to her efficiency, heart-breaking and discouraging to the captain and officers, who would see all their previous work in preparing the ship for the crucial test of battle upset at the advent of the trial. It is difficult to imagine that such a policy of changing horses whilst crossing a stream can be contemplated ; yet, if this is not so, what is the alternative ? It can only be that the ships in commission will retain their crews, and those put in commission on the outbreak of hostilities will have a large proportion of Naval Reserves. Would this be a satisfactory state of things ? or in other words, do the Naval Reserves sufficiently meet the requirements of

[1] Excluding 4,000 boys under training.
[2] Including boys under training.

men-of-war's men to justify their forming such a large proportion of the seamen element of the crew as would be required?

No definite answer can be given to this question, for it must be remembered that as far as actual experience in the sea-going fleet goes, the Naval Reserve must be considered an untried Force. It is true that a few hundreds have been embarked for the manœuvres as supernumerary (or at any rate forming a very small portion) to the regular crew of the ship, but the experiment of employing them in the proportion in which they would have to be used in war has not been tried. We can only, therefore, judge of their probable qualities by considering how far their ordinary pursuits and training fit them for fulfilling the requirements set forth on page 352.

Lord Brassey says: "The best seamen in the mercantile marine seek employment in the great lines, where the voyages are comparatively short, and men can depend on returning to their homes at frequent intervals. The men enrolled in the first-class Reserve may be more available for the Navy, as having been more accustomed to long service at sea and to discipline on board ship; but the second class are men of fine physique, and capable of severe labour—they are inured to the hardships and dangers of the sea, and have a minute knowledge of the coast."

Requirements Nos. 1, 2, and 3 appear from this to be fully met.

Lord Brassey gives the following details, quoted from a Parliamentary paper, as regards the numbers of men drilled in the batteries and drill-ships—stationary drill-ships—such as the

	Nos. drilled annually.
"Eagle"	1,238
"President"	787
Batteries	3,060

Examining the armaments of the drill-ships and batteries, all have an assortment of the older type muzzle-loading guns; all the drill-ships have at least one breech-loading gun of either 6-inch or 5-inch calibre, and all have one 3-pounder Q.F. Hotchkiss gun, together with one or two 1-inch Nordenfeldt machine guns. None are supplied with the larger natures of Q.F. guns (6-inch or 4·7-inch) or Maxim machine guns.

Of the thirty-six drill batteries, seventeen have no breech-loading guns, and only two have Q.F. guns of the smaller calibres.

A large number of men perform their drill on board ships of the First Reserve Squadron, which have armaments of modern type, and must therefore be considered better prepared to take their place on board a man-of-war than are the men drilled in the batteries.

Perhaps the most important duty on board a ship in action would be the supply of ammunition; if the supply is not rapid and uniformly maintained the action of the guns is paralysed, more especially would this be the case with Q.F. guns, whose possible rate of fire is far in advance of the supply of ammunition which can be maintained by the most carefully drilled ammunition and supply parties. Besides being the most important duty, it is the most difficult of attainment, requiring the

magazine parties to have the most intimate knowledge of the fittings and means of reaching the guns through the labyrinth of decks and passages which usually divide the magazines from the guns. Of this essential duty men trained in the batteries or drill-ships can have only a theoretical knowledge derived from lectures, and even the practical acquaintance with the duty of those men who undergo training in the First Reserve ships, from the shortness of the time, must necessarily be only perfunctory.

Very few, if any, of the Naval Reserve men can have any knowledge of turret gun drill, and they are not, it is understood, instructed in any torpedo work.

In view of the foregoing facts, it must be conceded that requirement No. 4, viz., "Efficiency in gunnery and torpedo work of all descriptions," is only very partially met.

A large and extensive personal knowledge of the Naval Reserve men, a knowledge which few naval officers possess, would be required to answer the question if requirement No. 5, "Education, intelligence, trustworthiness," can be said to be fulfilled. Judging from the satisfactory reports of the progress made in drill, it would appear that as regards education and intelligence, at any rate, the Force comes up to the ideal. Trustworthiness is such a comprehensive term, that actual experience under the many and varying circumstances which occur in service afloat would be necessary before a just answer could be given.

Requirement No. 6 embodies the qualities inseparable from any man whose life is spent on the sea; whether in a ship or a fishing-boat, they are daily and hourly called into play by the instincts of self-preservation; "alertness, readiness of resource, quickness of decision," we should expect to find in a marked degree in men from whose ranks the Reserve are recruited. To mass these qualities under the term "smartness" may be open to objection; that is, as the term "smartness" is understood in the Navy. It is conceivable that "alertness, readiness of resource, and quickness of decision" may be present, but unless concentrated and disciplined, they would not satisfy the naval definition of smartness.

Requirement No. 7, "Knowledge of stoking and work in the engine-room." It is unlikely that very many of the Reserve can lay claim to any such knowledge, and it may be said that the same applies to the men of the Regular Service.

Last of all the qualities, but by no means the least, required in the man-of-war's sailor comes the consideration of *discipline*. It is unnecessary in this essay to insist upon the all-importance of this quality, vital as its possession is held to be by all engaged in the profession of arms. Are the men of the Naval Reserve in their ordinary pursuits accustomed to, and brought under the sway of, discipline? In discussing the question, a fairer opinion on the point can be arrived at by considering each class of the Reserves separately. Taking the second class first, they are nearly all fishermen, working in crews of three or four, each man with his own duties to be performed, carried out with little dependence on his fellows; all of which circumstances are more calculated to form habits of independence than discipline.

As regards the first-class Reserve, they, forming part of the regular sea-going mercantile seamen, must be judged by the standard of discipline maintained in the mercantile marine. On this subject Lord Brassey says: "The first-class liners are well manned; but the crews placed on board foreign-going sailing-ships are sometimes little better than an undisciplined rabble. And *want of discipline* and too slender complements may be the cause of fatal disaster." Here, then, we may conclude that as regards the first-class Reserve, judged from a point of discipline, those men who are fortunate enough to serve in the first-class liners are accustomed to this exercise, but their less fortunate brethren are not so. On the whole, it would appear that discipline would have to be learned after the men are embarked on board men-of-war.

If the standard put forward as that which should constitute the man-of-war's man be accepted, and judging the Royal Naval Reserve by that standard, it must be confessed that, under existing regulations, the Royal Naval Reserve do not meet the requirements of the Navy. It is not surprising that this is the case, if it is considered that this Force was called into being at a time when the Regular Service men were sufficient to man the ships then existing, and the Reserve was intended to be what its name implies, viz., something to fall back upon after the first brunt of battle was over, and when our enemies would also be looking to their Reserve to supply the waste. Since then the construction of ships has proceeded rapidly, and the additions to the effective sea-going fleet have out-distanced the supply of men to such an extent that the Reserve has been called upon to do that for which they were never intended, viz., to take their place side by side with the men of the Regular Force, to meet, with meagre training, the well-trained men of our possible enemies. England is singular, with the exception of America, in this respect, for all other nations pass their Reserves through their Navy. France, for example, considers three years a necessary qualification, Germany three years in a commissioned ship, Italy three years, and Austria four years.

Admiral of the Fleet Sir Geoffrey Hornby has put the case very plainly. In the discussion on the paper read by Lieutenant Crutchley, R.N.R., he says: "First, that it is not sufficient for a man to go to sea; to become a seaman fit for war, he must be trained for fighting purposes. A very important matter is, that he should know and trust his comrades." Here, perhaps, is the crux of the matter; the Navy does not know the Royal Naval Reserve, and the Royal Naval Reserve does not know the Navy. Perhaps it is due to this mutual want of knowledge that one searches in vain for a definite answer to the question: *Is the Naval Reserve by its constitution and training equal to the position it now occupies in the scheme for manning the fleet?* Even in the lecture referred to, where it would be expected to be found, the question has been fenced about, but not met. Lord Brassey evidently is not satisfied, for as late as the beginning of this year, he says: "There is no reason to complain of the quality of the Force. Their efficiency is a simple question of the number of drills insisted upon, and that again is only a question of expense." In such a vital matter it is well not to deceive ourselves, but to speak out

what is in our minds. This the writer ventures to do, and he is of opinion that the answer must be *No.* It is not the *personnel* he finds fault with—here little ambiguity will be found in the literature on this subject—one and all are agreed that the source from which the Reserves are recruited cannot be equalled ; the fault lies in the training and constitution of the Force, for no Reserve can be considered satisfactory the members of which have not passed through the Navy.

However this may be, the fact remains that we have the Reserves, and they are, and must be for a considerable time, the only means at our disposal of supplying the deficiency in the Regular Service. The first consideration must, therefore, be their improvement as far as possible. When this is done, and not till then, can we turn our attention to a plan for creating a better trained Force. A great deal has been done of late to increase the efficiency of the Reserve. Efforts have been made to supply them with modern guns in their batteries, but still much remains to be done in this respect. Necessarily, the re-armament of drill batteries must be slow, as it is only after the fleet has been fully supplied that guns can be diverted to this purpose. But even supposing that the wishes of the most critical were met in this respect, it should not be considered that battery-drilled men were efficient. However well drilled in a battery, there remains much to be learned which can only be done when drill is carried out on board a modern ship. It is, therefore, urged that modern cruisers should take the place of the drill-ships, and others be stationed round the coast at points as near as can be obtained to the drill centres. Every second year the men should be obliged to put in their drill on board the cruiser.

Every endeavour should be made to pass as many as possible through a short training on board a sea-going ship in commission. A start in this respect has been made; in the manœuvres of 1892, 469 men, and in 1894 535 men were embarked. It does not appear that any are to be embarked for the manœuvres this year,[1] but it is very satisfactory to learn that arrangements have been made for embarking men for six months' training in the fleet. It may be that some other points have been overlooked ; if so, it is regretted ; but the main point is to bring the Reserve up to the highest state of efficiency that their constitution admits, and that as quickly as possible.

PROPOSED PLAN FOR ENSURING AN ADEQUATE SUPPLY OF SEAMEN AND RESERVES.

Undoubtedly the plan which would give the most satisfaction to naval officers would be to enter sufficient service ratings to meet all the requirements of the fleet, but on the score of expense alone this is not feasible. It is conceivable that in a time like the present, when public opinion is alive to the wants of the Naval Service, that money would be granted to raise the number of the men to the amount necessary to meet the requirements of the fleet. It must not be forgotten, however, that history repeats itself, and that public opinion is a very variable quality, subject

[1] A proportion of the Reserves were, however, embarked in this year's manœuvres (1895).

to enthusiastic heights to be succeeded by hollows of apathy; to be safe with this shifting quality, it is better to take a mean course, and not trust alone to the crest of the wave of enthusiasm without taking into account the hollow of apathy. Lulled into apathy by the postponement of the inevitable war, public opinion will in course of time become indifferent to the needs of the Navy; and the Government of the day, finding itself burdened with an increasing non-effective vote, will try to reimburse itself by reducing the numbers on the effective list. If any are inclined to doubt on this point, and to consider the view taken to be pessimistic, let them look into the state of affairs prevailing in the period preceding the Naval Defence Act.

Even supposing it were possible to increase the Regular Service strength to the required amount, there still remains the very important question of the Reserve. Hitherto we have looked to the mercantile marine as the sheet anchor of the Reserve; but from recent statements in the Press, and from the writings of those in the best position to know, it is apparent that the source is failing. The mercantile marine as regards *personnel* is itself in a bad way, and signs are not wanting that it is looking with longing eyes towards the naval *personnel* for help out of its difficulties. When we read the following, we may well be excused if we rub our eyes and ask if we have not been living in a fool's paradise.

"To maintain the first-class Reserve at a strength of 12,000 men, under the strict conditions laid down as to age, nearly exhausts the resources of our mercantile marine. At the last annual meeting of the Chamber of Shipping, Mr. Williamson of Liverpool, a well-known authority, submitted a statement, showing that of a total of 235,000 hands employed not more than 55,000 are British seamen. This is little more than half the strength of the French Naval Reserve. How far we can rely on the mercantile marine in the future, I will not venture to speak too confidently. Mr. Williamson is of opinion that the Navy must depend exclusively on men trained in the Service, and the Chamber of Shipping supports his views."[1]

Lieutenant Crutchley does not take quite such a gloomy view as this, but he has expressed the opinion that the mercantile marine is in danger of passing into the hands of foreigners. He also says that "the demand at sea now is for one of the two things: either apprentices who will pay a premium to go to sea, or else the so-called able-seamen." If only the wants of the mercantile marine are considered, probably a short-service system in its entirety, viz., the maintenance of a sufficient number of petty officers as a standing Force, all others being short-service men, would meet the case. But the Navy is the first consideration, and such a system is repugnant to naval officers, and in the writer's opinion rightly so. It is also open to the serious objection that the number of men which would pass through the Navy, and then have to find employment, would be more than the mercantile marine could well do with. The market would become in course of time glutted, and the evils to which the short-service system in the sister Service has given rise to would be

[1] "Brassey's Naval Annual."

reproduced. But if enough—and only enough—men that could find employment in the mercantile marine were passed through the Navy, no such evil need be anticipated; for it must be remembered in comparing a short-service system as applied to the Army, with such a system applied to the Navy, that the former mostly turns out *unskilled* labour, but the latter would turn out *skilled* labour, and that of a kind of which the country is much in need.

In view of the foregoing considerations it is proposed:—

a. To maintain the continuous-service system in the larger body of the naval *personnel*.

b. To pass a number of short-service men through the Navy, and so to form a well-trained Reserve.

To be more explicit, it is proposed:—

1. That two-thirds of the war complement of seamen should be continuous-service men, entered and trained as at present.
2. To build up a Reserve by entering lads at ages from eighteen to twenty for a period of five years in the Navy. Then to serve five years in the second-class Reserve, and fifteen years in the third class.

First-Class Reserve.

These would be really non-continuous service men, under an engagement to serve five years in the Navy, and afterwards to join the second, and finally the third-class Reserve. Perhaps Reserve, applied to the men of the first class, is not a good name, a better one might be found; but for convenience of classification it has been adopted.

It is proposed that this class should be entered from the shore at ages between eighteen and twenty. They should be able to read and write up to the Board School standard; with our system of national education it is not anticipated that many would fail on this account; on entry they would receive the rating of ordinary seamen, and be drafted at once to a sea-going training-ship, where they would remain six months. As to what description of ship should be employed as training-ships, opinions will probably differ. Some will prefer ships of the corvette class, where the facilities for sail drill are extensive; but, on the other hand, as the object of the six months' training would be principally to rub the sharp edges off, and knock the lads generally into shape, more roomy ships, such as the "Northampton," and older class masted ironclads of the "Minotaur" type, would, on the whole, be preferable. When we come to consider the question of stokers, an additional reason for employing these latter ships will arise.

Having completed the six months in the training-ships, the men should be drafted to ships on foreign stations in such numbers as to constitute one-third of the seamen complement of the ship. The following is a most important point in the scheme, viz., to avoid any dislocation of the crews of ships abroad on the outbreak of war; their crews from the first should consist of two-thirds continuous-service men, and one-third first-class Reserves. It would be advisable in order to give

the men as much experience as possible during their period in the Navy, that commissions abroad should be not more than of two years' duration.

During their service the men should be rated able-seamen, provided they passed the examinations in seamanship and gunnery, and had the other qualifications required from continuous-service men before receiving this rating. It is not proposed that any higher rating than A.B. should be open to these men, neither should they, however desirable, be allowed to become continuous-service men. This latter point would have to be insisted upon, for if the contrary were allowed, it might have a prejudicial effect when the men were seeking employment after their discharge into the second-class Reserve. People might say: "the Navy keeps the best men, and sends the rubbish to seek employment." The proposed division of the five years in the Navy is as follows:—

Sea-going training-ship	½ year
Commission abroad	2 years
,, ,, ...	2 ,,
Leave, passage to and from station, or paying off and recommissioning	½ year
Total	5 years

The next consideration is the number of men which should comprise the first-class Reserve. It is estimated that to meet the requirements of the fleet, 55,556 seamen, including in the term all lower-deck ratings except engine-room complements and Marines, are necessary. Of these, it is proposed that 40,000, that is, two-thirds, with an allowance for sickness, etc., should be continuous-service men. The function of the first-class Reserve being to supply one-third the complements of ships on foreign stations, it is estimated that 9,500 men, in round numbers, would be required. Supposing that an annual entry of 2,000 men is made, this number, allowing for waste, is reached in five years, as the following table shows:—

Entry, 2,000 annually.

Strength at end of—

1st year	*2nd year*	*3rd year*	*4th year*	*5th year*
1,965	3,900	5,806	7,683	9,532

At the end of the fifth year, the first-class Reserve would be at its maximum strength of 9,500, at which it would be maintained on the one side by the annual entry of 2,000 men, and on the other by transferring those men who had completed five years' training, into the second class.

Second-Class Reserve.

The second-class Reserve would consist of men who had served for five years in the Navy. They would, on completion of this service, be discharged ashore, it is hoped to enter the mercantile marine, to become yachtsmen; or if originally recruited from the admirable class of men from which the present second-class Reserve are obtained, to take up their occupation of fishermen. The function of the second-class Reserve is intended to be similar to that of the first-class Reserve, but only so far

as providing the proportion of crews for ships in the Fleet Reserve, first Reserve ships, merchant cruisers, etc. To ensure their being available in the event of a sudden mobilisation for war, the length of voyages they would be allowed to undertake should be limited. To save time in getting them together, they should be at Admiralty call without the necessity of a Royal Proclamation, and would be required to serve in any part of the world. As regards training, they would be required to undergo an annual drill on board a Reserve cruiser, or in a drill battery, always provided that every second year the drill is performed on board the cruiser. As regards the annual retainer to be paid to these men, consideration must be given to the limit placed on the length of voyages in the mercantile marine allowed to be undertaken, and the call the Admiralty would have on their services. It is suggested that an annual retainer of £12 per annum for those men who leave the first class with the rating of able-seamen, and £10 to those who leave as ordinary seamen, would be sufficient. In addition, they would receive drill money and lodging allowance whilst undergoing the annual drill.

The success or failure of this scheme depends whether men of this class would or would not be certain of employment in the mercantile marine or elsewhere. If the wants of the former are correctly gauged by the opinions expressed in the theatre of the United Service Institution and in the Press, such a scheme would supply the very men wanted to wrest the mercantile marine out of the hands of the foreigner. There is, undoubtedly (it would be useless to pass over the fact), a feeling of distrust of Naval Service men in the Merchant Service ; the fact has been stated to the writer more than once by shipmasters. Such a feeling is, no doubt, due in a great measure to want of knowledge and to generalising by a few isolated instances of acquaintance with Service men, who, it is more than probable, left the Navy for the Navy's good. But the prejudice does exist, and it would have to be overcome until larger acquaintance with men trained in the Navy dispelled the notion. It is possible, therefore, that a little pressure must be resorted to, in order to obtain employment for the first batches of men passing into the second-class Reserve. Means are at hand for doing this, by insisting in contracts for mails, contracts for transport work, and, in fact, any contracts under Government, that in the subsidised ships, etc., a large proportion of the crew should be men belonging to the Reserve. Such measures as these, together with the co-operation of the Chambers of Commerce, underwriters, etc., would obtain employment for a large number of men ; and it is confidently expected that, as their value became recognised, prejudice would be succeeded by eager calls for their services.

It is proposed that five years should be passed in the second-class Reserve, subject to all its restrictions. As regards the numbers of the second-class Reserve, this depends on the numbers passed through the first-class Reserve. Following the latter up, we find at the end of the fifth year of its existence that 1,849 men would be transferred to the second-class Reserve. The following table gives the strength to which

the latter would attain year by year until reaching the maximum strength :—

Strength at end of—

6th year	*7th year*	*8th year*	*9th year*	*10th year*
1,821	3,614	5,380	7,120	8,834

At the end of the tenth year, from the commencement of the scheme, the second-class Reserve would reach its maximum strength of 8,834 men, at which it would be maintained by the annual transfer of men *into* it from the first-class Reserve, and *from* it into the third-class Reserve.

The Third-Class Reserve.

The third-class Reserve would consist of men who had passed five years in the second class (having previously passed five years in the first class). It would form the Reserve in the proper sense of the term, being the last called upon in the event of war. As it is considered that with the continuous-service men, together with the first and second-class Reserve, we should have sufficient men to equip every vessel fit for sea, the function of the third-class Reserve would be to supply the wastage of war. Under these circumstances, time would be available to collect the men, and, therefore, restrictions as to length of voyages, etc., could be much relaxed, and it also would be sufficient if they were called out by Royal Proclamation. As far as possible an annual training should be carried out, but subject to modification in the case of men engaging for long voyages. By the time men reach the third class they should be in the way of obtaining regular employment, and it is suggested that an annual retainer of £6, together with drill-money and lodging allowance when undergoing annual drill, would be sufficient remuneration.

It is proposed that fifteen years should be passed in the third-class Reserve, at the end of which period they would be relieved from further compulsory liability to serve. A pension would be a great inducement to the men to keep themselves up in their drill, and to ensure observance of the regulations. The pension fund might be formed by compulsory contributions during the time in the Service, to be supplemented by a Government grant.

The following table gives the numbers to which the third-class Reserve might be expected to attain, in the years quoted :—

Strength at end of—

11th year	*15th year*	*20th year*	*25th year*
1,688	8,114	15,453	21,783.

At the end of the twenty-fifth year, counted from the year in which the first entries for the first-class Reserve were made, the third-class Reserve would reach its maximum strength of 21,783 men.

It is evident from the foregoing that not until the tenth year is over would the third-class Reserve come into existence. Until this period is reached, the present Royal Naval Reserve would have to be maintained at its existing strength, after which it might be allowed to reduce itself as its place was gradually taken by the new third-class Reserve.

The following table shows how the foregoing scheme would operate in supplying men of the seamen class, available for sea service and in Reserve :—

—	End of 5th Year.	End of 8th Year.	End of 10th Year.
Continuous-service Men	40,000	40,000	40,000
Coastguard	4,000	4,000	4,000
First-class Reserve (new)	9,532	9,532	9,532
Second ,, ,, ,, ...	—	5,380	8,834
Total available for sea-service ..	53,532	58,912	62,366

Reserves, First class (old)	10,800[1]
,, Second ,, (old)	10,600[1]
Pensioner Reserve	2,000
Total	23,400

ARTISAN RATINGS.

It is not considered necessary to deal separately with the artisan ratings. The numbers required are included under the heading of seamen. It is proposed that the same system of entry, training, and distribution should apply to this class, as given in the preceding.

ENGINE-ROOM RATINGS.

a. Engine-Room Artificers.

These men occupy a most important position amongst the engine-room ratings, and are the backbone of that service. They are the trained mechanicians on whom, under the engineers, the practical work of repairs and maintenance of the complicated machinery to be found on board the modern war-ship falls. Hence their experience and training must be such as to give them a most intimate knowledge of war-ship machinery in all its branches. If we consider what a mass of engines, all of different types, are to be found on board a modern battle-ship, and only differing in degrees on the smaller vessels, we are forced to the conclusion that nowhere but in the Navy itself can such training and experience be obtained. The men who assist to drive the Atlantic liners have a light task compared to the work which falls to the naval engine-room artificers; on these grounds it is essential that the numbers of this rating required for the fleet should be kept up to the full amount—such appears to be the view taken by the Admiralty, if we can judge by the near approach of the numbers required to that estimated for. The Estimates of this year propose to raise the number to 2,134, and it is calculated that when the ships building are ready, some 2,400 will be required. It is true that in some quarters it is held that the complements allowed by the Admiralty

[1] Would be superseded by third-class Reserve (new).

are inadequate for the service of the ship; however this may be, accepting the Admiralty complements, the numbers stand as stated.

A Reserve of continuous-service artificers is very desirable; from the foregoing it will be seen that such does not exist, neither does any provision appear to have been made for obtaining a Reserve from the mercantile marine. In the latter service the class of men most nearly approaching the naval engine-room artificers are those known as "Greasers." From this body it would probably be easy to raise a Reserve, and if we put the number down as 1,000, we should be most likely under the mark. It may be that it is considered these men would be available and fit, without any training in the Navy, to be embarked on the outbreak of war. Such a policy does not commend itself, even on the score of economy (neglecting for the moment the question of training), for it would put it in the power of the men to demand what bounty they liked; the history of raising men by bounty shows it to be in the end the most expensive of all methods. Training certainly does appear to be very necessary; what, for example, would be the feelings of a man taken from the engine-room of a Cunarder and put into the engine-room of a torpedo-boat destroyer? And, moreover, would he be any use when he got there? It is thought his room in the limited space would be considered preferable to his company. Given that a case has been made out for the establishment of a Reserve, we can proceed to discuss the question of training; the following is proposed:—

On entering the Reserve, the men to be sent to the steam reserves of the dockyards for six months. Whilst there they would assist at the steam trials of ships, and receive instruction in running torpedo-boat destroyers and torpedo-boats, together with the manipulation of torpedoes. Any spare time available to be taken up in working on board ships, etc., in the Reserve. Such an experience as this would be invaluable, and lay the ground work of knowledge in naval engines of war.

When dealing with the seamen portion of the Naval Reserve, it was advocated that cruisers should be stationed at various points round the coast to increase the facilities of training. The value of such ships is much enhanced when the question of training the Reserve of engine-room artificers and stokers comes to be considered, and much more valuable for the latter purpose will they be if a torpedo-boat destroyer or first-class torpedo-boat be attached to each. The annual training of twenty-eight days of the engine-room artificer Reserve could be performed in the engine-rooms of these ships and in the affiliated torpedo-boat, embracing practice in the manipulation of torpedoes. As the time is limited for the amount of work to be done, it is not proposed to give any instruction in drill, although the opinion is strongly held that every man on board a fighting ship should be instructed sufficiently in the use of weapons to be able to defend himself; if time permitted for any such instruction, a knowledge of cutlass drill and of the use of a revolver would be enough.

b. Stokers.

It may be said that stokers do not require as much training as

seamen—possibly this is so; at any rate, it is a point on which much difference of opinion exists. What must not be forgotten is the absolute necessity of discipline amongst stokers, and discipline below decks, in ignorance of what is going on above, joined to the absence of the excitement of battle, is the most difficult to maintain. On this latter point alone, it would be highly undesirable that the Navy should have to depend on men who have not been trained in the Service. There is reason to believe that, under existing circumstances, such dependence does exist—namely, that the deficiency in stokers must be made up in either of two ways, or, perhaps, by a combination of both:—

1. From the firemen of the Royal Naval Reserve.
2. By enlisting men from the mercantile marine under a bounty system.

No doubt many excellent men could be obtained from these sources, but they would lack disciplinary training; and as regards the second source, there is the additional objection from an economic point of view of the bounty system. The difficulty also of *distribution* in peace-time, so as to avoid dislocation of crews on the outbreak of war, has to be remembered. This latter difficulty is more important even as regards stokers than as regards seamen, for it is a well-known fact that the steaming powers of ships improve as the engine-room complements become accustomed to their work. To upset the stokers' crew at a time when economy in coal and the highest rate of speed are most required, would be false policy indeed.

A plan similar to that proposed for the seamen class is suggested for the stokers as being the most suitable for training and distribution.

It is calculated that to meet the requirements of the fleet built and building 18,000 stokers are necessary. To meet this number, it is proposed in the present year's Estimates to raise the number of continuous-service stokers borne to 15,232, and the firemen of the Naval Reserve to 2,000; possibly, another thousand men might be got together from the Pensioners' Reserve and Coastguard. Hence, using up all available resources, the number of 18,000 might be met if the total number of Naval Reserve firemen can be laid hands on, and making no allowance for men non-available through sickness, etc.

The most probable result would be that the number forthcoming would fall short of the number required by some 3,000, and, of course, there would be no Reserve. But to get back to the proposed plan, taking 18,000 as the immediate requirements for a war mobilisation, it is proposed that 14,000 men should form the complement of continuous-service men, 2,800 in the first-class Reserve, and 2,650 in the second-class Reserve.

Stokers First-Class Reserve.

The conditions of entry would be the same as for the seamen, viz., to serve five years in the Navy, five years in the second-class Reserve, and fifteen years in the third-class Reserve. The distribution of time would also be the same, viz., six months in the sea-going training-ship, four years in two commissions of two years abroad, and six months spent

in leave, passage to and from stations, etc. One-third of the stoker complement of a ship on a foreign station would be composed of this class. In dealing with the seamen class when under training, it was said that the larger old-type ironclads were preferred for the purpose over the corvette type of ship. An additional reason for the preference given is to be found in the facility given in the large stôkeholds and engine-rooms of the ironclads for training stokers; also these ships are capable of carrying second-class torpedo-boats—an important item in the training of the naval stoker. Opportunities should be taken of instructing the stokers in rifle, cutlass, and pistol drill. No other drill should be attempted, as it is thought that if a stoker is fairly efficient in these, as well as in his more immediate work, he would be well equipped for his part in naval warfare.

The men, on entry, would be rated stokers second class, and if found efficient during their term in the Navy be advanced to stoker first class; no further advancement would be open to them, for the reasons given before.

An annual entry of 600 men would be necessary to raise the number required in five years, and to feed the lists in future years. Allowing for waste, the "state" at the end of the years given in the following table would be:—

Entry, 600 annually.

At end of—				
1st year	*2nd year*	*3rd year*	*4th year*	*5th year*
589	1,170	1,741	2,305	2,855

At the end of the fifth year, the first-class Reserve of stokers would attain its maximum strength of 2,855; and 550 of these would be transferred to the second-class list.

Stokers, Second-Class Reserve.

Men in this list would be dealt with in all respects as proposed for the corresponding class of seamen Reserve, under the same restrictions and receiving the same pay according to rating. One exception must be made, that is regarding the annual training, this should be performed on board the cruisers and never in a drill battery. It would embrace instruction in the engine-rooms of the cruiser and torpedo-boat, and a rub up in rifle, cutlass, and pistol drill.

The "state" of this class works out as follows:—

At end of—				
6th year	*7th year*	*8th year*	*9th year*	*10th year*
544	1,082	1,612	2,134	2,648

The maximum strength of 2,648 men would be attained at the end of the 10th year, and 514 would be transferred to the third-class list.

Stokers, Third-Class Reserve.

It is not necessary to recapitulate the functions, etc., of this class, as they would be similar to those proposed for the seamen class, and as

regards training to the stokers second-class Reserve. We can proceed at once to forecast the "state."

At end of—

11th year	*15th year*	*20th year*	*25th year*
506	2,434	4,635	6,534

In twenty-five years a Reserve of 6,534 stokers, all of whom had served in the Navy, would have been built up.

Collecting our Forces, the following table gives the state of the engine-room complements available for sea-service and in Reserve:—

—	End of 5th Year.	8th Year.	10th Year.
Continuous-service Men—			
Artificers	2,400	2,400	2,400
Stokers	14,000	14,000	14,000
Coastguard Stokers	500	500	500
First-class Reserve Stokers ..	2,855	2,855	2,855
Second-class „ „	—	1,612	2,648
Total available for sea service ..	19,755	21,367	22,403

Reserves for 10 *Years.*

Firemen R.N.R.	2,000
Pensioner Reserve	500
Total	2,500

The table given under the heading of stokers, third-class Reserve, shows how the new Reserve scheme would operate in building up a Reserve. It is not necessary to repeat it here.

The existing Reserve of firemen R.N.R. could not be dispensed with for at least ten years, when, as in the case of the seamen R.N.R., they might be allowed gradually to die out as their places were taken by the new third-class Reserve. With improved methods of training, together with a service of six months in the Fleet, their efficiency can be increased, but under their present organisation they can never meet the needs of the Navy.

The Marines.

The part played by the Marines in the Navy has of late years undergone a great change. Some ten years ago, the Marines were considered almost supernumerary to the complement of a ship, and instructions were laid down that, in "quartering" the ship's company, stations were to be allotted to the Marine detachment of such a nature that, on their landing, the fighting of the ship would not be materially interfered with. The small armaments, numerically speaking, carried by the ships of that period allowed this to be done. At general quarters a large proportion of the Marine detachment were to be found performing

small-arm exercises on the quarter-deck, others were stationed at unimportant numbers at the guns, more with the object of finding something for them to do than of necessity, for there were more than enough seamen carried to allow all the guns' crews to be formed of them. Contrast, for instance, the "Minotaur's" armament of those days with the present. She had then seventeen 12-ton M.L. guns. She has now the same seventeen guns, with the addition of four 4·7-inch Q.F. guns, eight 3-pounder Q.F. guns, and eleven machine guns; the complement practically remaining the same. Crews, nevertheless, with the attendant ammunition parties, have to be found for the additional guns, and if we went on board this ship at general quarters now, the Marines would be found, not performing small-arm exercises on the quarter-deck, but occupying as important positions as any other men in the ship; if they were withdrawn for the purpose of being landed, then some portions of the ship's armament would have to remain unmanned. What is true as to the "Minotaur" is perhaps more so as to the modern ships; anyone who has had the task of preparing a quarter-bill knows how impossible it is to differentiate in the importance of the stations—every man in the complement has his place, and sometimes, it must be said, more than his place. The withdrawal of any men, Marines or seamen, will leave a serious blank somewhere in the fighting stations. If we think of it, we must at once recognise the fact that the Marine detachment forms as important a portion of the complement as a similar number of seamen would. Happily this point has not been lost sight of, for whereas in former days knowledge of naval gunnery was almost exclusively confined to the Marine Artillery, now the Light Infantry are well trained in their barracks in this respect, and the majority of them, over a certain service, qualify for the rating of trained men. The line of demarcation separating the Marine Artillery from the Light Infantry is not so broad as it was—fusion of the two branches has been mooted more than once. No doubt, much might be said for this from an economical point of view, but everything must not be sacrificed to economy; if we look upon the Marine Artilleryman as bearing the same relation to the Light Infantryman as the seaman gunner does to the trained man, there is much to be said against the idea. The difference in the officers' training has to be considered, although, happily for the corps, as good gunnery officers are to be found amongst the Infantry as amongst the Artillery. Satisfactory as the Marines of both bodies now are, it is to be hoped that under no circumstances will their sea training and experience be allowed to be less than it has been. Unfortunately, danger of this—at any rate, as affecting a large body of men—is to be feared, for, owing to the dearth of seamen which has characterised the Service during the past few years, the Marines forming the complements of the harbour ships have been much increased. It follows, therefore, that unless care is exercised the sea-going experience of these men will be lessened. In the last few years, a strong battalion of Marines have been sent annually to Aldershot, and have, to the credit of the corps, called forth much praise for their steadiness and drill; this movement must be jealously watched by naval

officers, in so much that it is liable to divert the attention of the officers and men from the reason of their being and calling, which should be sailors first and soldiers afterwards.

The Navy is proud of the Marines, and therefore it is satisfactory to find that their numbers are almost up to the prospective requirements of the fleet. 15,363 is the strength estimated for this year, and there is no lack of recruits; it is calculated that 16,700 will be enough to form the complements of the ships built and building. A system of entering men for a period of five years to build up a Reserve—which in the case of seamen and stokers might be practicable, for these latter on entering the Reserve have a trade to fall back upon—cannot be applied to the Marines; for the reason that to do so would be to add to the numbers of the unemployed, and thus to intensify the difficulties of the Army Reserve. There is nothing for it but to keep the strength of the corps up to the limit necessary for the requirements of the fleet, trusting to the small Reserve to be obtained from the pensioners' list. Unless, indeed, their strength is raised to a point, not only sufficient for the fleet, but sufficient also to provide garrisons or part garrisons for some selected coaling stations. The opinion is no doubt held by many that, inasmuch as the Marines so employed would form the garrison of the station, they could not be withdrawn for purposes afloat. Granted, at the beginning of the war; but it is allowable to think that, provided the command of the sea has been obtained, part of the garrisons could be withdrawn, and it is not till then that their services would be required afloat. There is another point in favour of this plan: the opinion is held by many officers that expeditionary raids of comparatively small forces will form a prominent feature in future naval operations; now for such services as this the Marines, by their duplex character, are of all our fighting forces the most suitable. The admiral commanding on a foreign station would be very delighted to have, say, 2,000 Marines at hand for such a purpose. It may also be objected that the sailor qualities of the Force would deteriorate: but this could be guarded against by changing, say once a year, the detachments of the ships on the station with men taken from the garrisons. Whatever may be said on the foregoing plan for increasing the numbers of the Marines, at the risk of repetition it must be again stated that the main point to be borne in mind in dealing with this corps is that the detachment borne in a ship forms an integral and inseparable portion of the combatant branch of the crew. The proportion of Marines borne to the other combatant branches varies from one-fourth to one-fifth.

OFFICERS.

Executive Officers.

It is a truism to say that of all the most difficult subjects to deal with the supply of executive officers heads the list. Much has been said and written on the point, and many solutions of the problem have been put forward; but still, matters remain in a far from satisfactory state. In discussing the question of the officers there is one rank which forms the focus, that is the lieutenants' rank. It is quite unnecessary to

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enlarge on the importance of this rank in such an essay as this, written for professional officers, who well know what being even one lieutenant short of complement in a sea-going ship means.

Why is the Navy so short of lieutenants at the present time? is a question that has on several occasions been asked of the writer. Those who have studied the past will have little difficulty in giving an answer, but it would be as well here to give the main points which lead up to the present dearth, as before attempting to cure an ill it is as well to consider from what the ill arises. Now, first of all, under our system of training it takes eight years at the least (the average is about nine) to turn the newly-joined naval cadet into a lieutenant, hence a change in the numbers entered eight years ago would be felt on the lieutenants' list at the present time. Eight years is a long time to look forward to, or to arrange the present policy by. No just blame can be attached to anyone for the present state of the list, for who, for example, twelve years ago would have imagined that the fleet would have attained the proportions of the present? Many may have lamented that the fleet was not being strengthened, but few could have thought that such a change in public opinion as took place in 1886 would have come about. On the other hand, about this period there was a redundancy of lieutenants, with the attendant difficulties of finding them employment and promotion. It is not surprising that the number of naval cadets was reduced, and a limit fixed as the strength of the lieutenants' list inadequate to the present needs of the fleet. But whatever the cause may have been, the practical fact remains that some 1,800 lieutenants are required, and there are now on the Navy List 840; if we add to this number 130 sub-lieutenants who have completed their courses of instruction, and who would be able to assist in lieutenants' duties, we have in all 970, leaving a deficiency in round numbers of some 800. The recent Order in Council has fixed the maximum strength of the list as 1,150, and, no doubt, the Admiralty were guided in their decision by the following factors:—

1. Number which can be fairly, constantly, and efficiently employed in peace-time.
2. The number should not exceed that for which an equable flow of promotion can be provided.

To arrive at the second consideration, the captains' list has to be considered first. We must accept the fact that captain's rank is the highest, except for the smaller number, to which a naval officer can aspire; naturally, the captains' list must be arranged with regard to the conditions laid down in (1), for to promote an officer in his prime into a rank where he would have small hope of employment would be cruel and unjust, and tend in the large number of cases to produce morose and discontented men. Better far to keep them fully employed in a lower rank. Having arrived at the number of captains, the commanders' list can be fixed with due regard to conditions (1) and (2), and, finally, the lieutenants' list. If promotion to captain is the sole objective, we see that the numbers of lieutenants on the peace list is fixed by hard and

fast rules. But would not a large number of men be satisfied short of this, if, for instance, there was a prospect of their being employed in duties more fitted to their age as they advanced in years, than the ordinary duties which fall on lieutenants or commanders, and which would carry with the performance of those duties increased pay? As an example of this, the Coastguard at present provides an outlet for commanders and lieutenants, and the appointments therein are much appreciated by those officers who see that their chances of promotion, owing to age, are slight. Provided some other safety valves can be found for the commanders and lieutenants' lists, an increase in the number of both would be justified.

To provide an additional outlet it is proposed to abolish the Accountant Branch of non-combatant officers, and substitute in their stead an equal number of executive officers, the accountant duties of the fleet being performed by the latter. The Army Pay Department is recruited to a large extent by regimental officers of the rank of captain; it cannot be contended that the naval lieutenant of, say, eight years' standing (when he would be about the same age as the Army captain) could not take over the duties of accountant officer and efficiently perform them. Once concede the desirability of making the proposed change, and no difficulty will be found in getting enough officers of sufficient ability to do the duties. The system under which executive officers would perform accountant duties could be arranged on similar lines to that under which the navigating duties of the fleet are now performed. An examination would have to be passed to entitle the officer to the letter A before his name, signifying that he was qualified to perform accountant duties. He would be obliged to keep up his knowledge of gunnery, torpedo, and general knowledge of an executive officer's duties—points which could be tested by the inspecting officer at the usual inspections. Of course, these officers would be borne as additional to the usual complement of executive officers, and would be free in peace-time from watch-keeping or acting as divisional officers, etc. But in war-time, when accountant duties would not be so onerous as they necessarily are in peace-time, how *invaluable* would their services be!

To perform the accountant duties of the fleet there are:—

Fleet and Staff Paymasters and Paymasters ..	144
Assistant Paymasters	171
Secretaries	18
Clerks	66
Assistant Clerks	27
Total	426

The total cost for the pay and allowances of these officers amounts to £108,413. Can the country afford the luxury of paying so much for officers who are not trained to any other duties than accountant work, when the dearth of executive officers is so great?

Under such a scheme as the above, room could be found for promoting warrant officers to commissioned rank, as they are accustomed to the charge of stores, and, consequently, would be valuable assistants to

the commander or lieutenant performing accountant duties in the larger vessels, whilst in some smaller ships they might be placed in charge. It is proposed that a certain number of warrant officers should receive commissions as sub-lieutenants in the first instance, being promoted after a certain service to lieutenants. Their status socially would be the same as that held by quartermasters in the Army, and although they would be members of the ward-room mess, their duties being of a distinctive character, no friction need be anticipated. Such prospect of promotion as here held out should, it is considered, satisfy the claims of the warrant officers, and give to the younger seamen a stimulus to exert themselves, and so provide for what is undoubtedly a need of the present day. Gunners, boatswains, and carpenters alike would be available for such promotion, so one of the difficulties surrounding the promotion of warrant officers to commissioned rank, viz., that the carpenters must be left out in the cold, disappears.

It is proposed that the accountant duties of the fleet should be performed by the following numbers of executive officers at the rates of pay stated :—

100	Lieutenants at	£225 per annum	=	£22,500
100	,, ,,	270 ,,	=	27,000
40	,, ,,	300 ,,	=	12,000
80	Commanders,,	400 ,,	=	32,000
100	Promoted Warrant Officers at	200 ,,	=	20,000
	Total cost			113,500
	Present cost of Accountant Branch ..			108,413
	Increase			£5,087

Hence for an increase of a little over £5,000 the lieutenants' list could be increased by 240, the commanders by eighty, and counting the warrant officers, 420 executive officers would be added to the Navy.

Some few years ago the Navy took over the care of its own ordnance stores, and in doing so transferred some officers of the Army Ordnance Store Department to the Naval Vote, establishing a Corps of Naval Ordnance officers. There are fifteen officers so employed receiving salaries from £400 to £600. There is no reason whatever why naval officers should not occupy these posts. If, on account of there being no outlet, the lieutenants' list cannot be increased, here at any rate is a very satisfactory one for at least fifteen lieutenants; as they would not, probably, take up such positions under ten years' seniority (allowing for waste in this time), an increase of thirty might be made to the list. This, together with the number required for accountant duties, would entitle the lieutenants' list to be increased by 350 (providing for eighty subsequent promotions).

The next question that has to be considered is, What is the best and quickest method of raising the lieutenants' list to the required number?

The following methods present themselves (leaving out the present

system of passing every officer through the "Britannia," a system which takes eight to nine years to make a lieutenant):—

I.—Promotion of Warrant Officers.

Much has been written and spoken on this matter, with the result that things remain very much as they were. However much we would wish to see this most deserving class of men benefited, it must be confessed at once that it is difficult to see that promotion to the executive ranks, when there to take their chance with the other officers on the lists, would in any way benefit the warrant officers. Such promotion might satisfy the ambition of a few, but it is feared that to the many it would turn out a dead sea apple—looking nice at the distance, but crumbling to dust and bitter ashes when tasted. Warrant officers could scarcely reach commissioned rank before thirty, by which time they would have married and formed habits according to the social scale in which they had up to this period lived; on promotion they would find themselves in a social atmosphere to which they were not accustomed; they would have expenses to meet to which their means were inadequate; and they would find that many of the deepest convictions of their previous lives were looked upon by their new compeers in a totally different light to that to which they were accustomed. All this, as self-respecting men, they would feel and resent. If the warrant officers are true to their own interests, they will cease from aspiring to enter the commissioned ranks on an equality with the other officers, and will be content to receive a commission on the same status that quartermasters in the Army do. Things would be quite different for them then, for when they join the ward-room mess their position would be distinctly defined, and they would not be expected to join in social entertainments which they could not afford. The other officers would treat them with deference and respect, knowing that they were not trying to be what they were not. How the promoted warrant officer can be usefully employed, has been pointed out when dealing with the Accountant Branch.

II.—Direct Entry from the Mercantile Marine.

The formation of a supplementary list of lieutenants by direct entry from the mercantile marine is now the subject of experiment, and such being the case it is only fair to keep silent until the system has had a trial.

III.—Direct Entry of Midshipmen by Competitive Examination.

The "Britannia" has turned out good officers in the past, and is now, no doubt, turning out as good, if not better. It is an institution which has borne the brunt of many an attack, but it appears to be more flourishing than ever. The Navy is very conservative in its habits, and looks with suspicion on any proposed change. But the "Britannia" costs £6,000 per annum, in addition to the pay of the captain, officers (exclusive of the educational staff, which is covered by the guardians' contribution of £75 a year) and crew, and it takes eight to nine years to

make a lieutenant. It seems well worth a trial to see if we cannot produce as good an officer at a cheaper and quicker rate than is possible under the "Britannia" system. There are numbers of young men about eighteen years old who have received, or are receiving, education in the public schools, fitted educationally, socially, and physically, eager for a sea life were they but given the chance. The present seems to be a fitting time to test if it is possible to knock them at that age into naval officers. Say that fifty appointments as midshipmen are offered for competition, the candidates to be not less than seventeen-and-a-half or more than eighteen years old. They would be obliged to be nominated, to produce certificates of good conduct and ability from the head-masters of the schools where they were educated, and, if successful, to pass a medical examination.

The subjects of the competitive examination to be as follows :—

Mathematics, including algebra, geometry, plane and spherical trigonometry.
Dynamics.
Statics.
Hydrostatics.
Physics.
French.
Latin.
Drawing.

A minimum number of marks to be obtained in each of the above subjects, even supposing the candidate to have been successful in the competition.

The successful candidates would be rated midshipmen, and at once sent to a sea-going ship, it being clearly understood that during this period the officer is on probation, and would have to be withdrawn at notice from the Admiralty if his conduct and general ability were not satisfactory. Having completed two years at sea, the officer would be examined in seamanship, etc., under the conditions now governing the examination of midshipman for acting sub-lieutenant. If he passes successfully, he would receive an acting commission as sub-lieutenant, and afterwards would follow the courses at Greenwich in gunnery, torpedo, and pilotage, now laid down for and under the same conditions as to promotion as other acting sub-lieutenants.

In this way officers could be added to the lieutenants' list in about five years on the average from the date of entry. The country would also be saved the cost of education in the "Britannia," as well as the cost of two years afloat as midshipman—a total saving which may be estimated roughly at £100 per officer.

Senior Executive Officers.

Constant employment is the one desideratum for officers of captain's and commander's rank to keep them efficient. It is to be regretted, as regards the former rank, that officers on promotion thereto have to undergo three years enforced idleness on half-pay. The commanders are,

perhaps, in rather worse strait, as, excepting those who are fortunate enough to obtain employment at once as second in command, they have to wait from four to four-and-a-half years before getting a sea-going ship. It is true that all this time is not spent on half-pay, as two years of it are, in most cases, employed as second in command of First Reserve or harbour ships. Perhaps we may see the day when the ships of the Fleet Reserve will be placed in partial commission, and that compulsory half-pay will become a thing of the past.

There is one more point in connection with the captains' list, which it may be well to call attention to, namely, the increasing ages at which officers attain that rank; some ten years ago the average age of captains on promotion was thirty-eight-and-a-half years, it is now approaching forty-two. The late Sir Geoffrey Hornby was in favour of young captains, and perhaps other officers who have had experience in command of squadrons may agree with him; it is a point on which they alone are capable of expressing an opinion. It may be mentioned *en passant* that the recent changes made in retirements of flag officers will probably have the effect in time of reducing the age of captains.

Executive Officers of Royal Naval Reserve.

It is preferred in discussing the subject of officers of the Royal Naval Reserve to do so without prejudice to the experiment of the formation of a supplementary list of lieutenants, in fact, to consider that the Order in Council had never been promulgated.

That such a competent authority as Lord Brassey is not satisfied altogether with the present order of things, is evident from the following quotation from his article which appeared in the "Naval Annual" of 1895.

"Several improvements in the present organisation are desirable. The selection of young officers for first entry is made too much at haphazard. The Admiralty should be assisted in the sifting of applications by a committee of shipowners, presided over by a naval officer from the Reserve Office, whose duty it should be to see every candidate personally, and to report as to his probable fitness. The co-operation of such a committee is urgently needed, not only in the selection of officers, but in the negotiation of the terms and conditions of their service, in advising as to rates of pay and allowances, in framing regulations, and, generally, in making Naval Service popular with the merchant officers, and in keeping the two great branches of our marine in touch with one another.

"Every midshipman should be considered a probationer until he has completed twelve months in the Navy, and been reported efficient in his duties. This service should be compulsory and adequately remunerated. Efficiency should be further tested and instruction should be extended by occasional service during the manœuvres and by periodical short courses in gunnery; officers of the Naval Reserve should be retired with honorary promotion as soon as they have become too old for duty in the ranks to which they belong. The older officers on the lieutenants' and sub-

lieutenants' list of the Reserve are not suitable for employment in these ranks in H.M. Navy, and, being in command of ships in the mercantile marine, they could ill be spared by the companies which they are serving."

The first portion of the above quotation appears to raise a doubt as to whether the best officers of the mercantile marine join the Reserve, but on this point it is only those who have an intimate knowledge of the mercantile marine officers who are capable of judging. Naval officers must perforce be content to think that their prospective comrades are, apart from their naval training, the best that can be obtained. No such silence is, however, compulsory when we come to discuss the amount of naval training required to turn the Royal Naval Reserve officer into an efficient auxiliary. Again and again articles and letters have appeared in the Press, the subject-matter of which may briefly be summed up as an attempt to show that the officers of the Reserve are competent to perform naval officers' duties because *they are better seamen and better navigators than naval officers*. Such contentions as these are absurd—no one doubts for a moment that in their own line mercantile marine officers are good seamen; they are probably as a class the best in the world. But there are many matters in naval seamanship of which the mercantile officer can have no knowledge, for instance, station keeping in a fleet, with the multifarious knowledge required of signals, fleet-lights, rules laid down in the signal-book for guidance under various circumstances when in company with other ships, etc.

In navigation for naval purposes there is also a peculiar side, which requires practice and experience. It is more than the simple matter of making a passage and anchoring a ship in a known harbour. There is the more difficult task of navigating with a fleet, entailing constant alterations of speed and course, consequent on the movements of fleet; picking up anchoring billets on specified bearings and distances, and other problems. It must also be remembered that something more than navigators pure and simple is required. Officers are wanted capable of taking charge of a watch, or a division of guns, as necessity may require.

Perhaps the quality in which Reserve officers are most lacking is that of taking command of men. This want is very conspicuous amongst those who have not undergone a twelve months' training in the fleet; this latter training, in conjunction with short courses in gunnery and torpedo, develops the powers of command and gives the Reserve officer, in short, a finish which makes him an efficient officer for the purpose for which he was enrolled. No confidence, it is not too much to say, can be placed in any Reserve officer who has not undergone the foregoing periods of training. It may be gathered from Lord Brassey's article that he is of the same opinion.

The following table gives the number of Reserve officers borne, distinguishing those who have undergone twelve months' training in the fleet, or who have obtained certificates in gunnery or torpedo on completion of short courses, etc.

Rank.	Number on List.	Served and serving one year.	Served for short cruise only.	Obtained Certificates in Gunnery, or Torpedo, or both, but have not served afloat.
Lieutenants	293	100	19	8
Sub-Lieutenants	370	80	7	5
Midshipmen	399	21	14	Nil.

Analysing the table, we see that 100 lieutenants, eighty sub-lieutenants, and twenty-one midshipmen have served, or are now serving, for one year in the fleet; in nearly all cases these officers have also obtained certificates in gunnery and torpedo, and may be considered good, competent, reliable officers. For supplementing the officers of the Regular Service, these could be taken without question for any service where they might be required. As for the remaining 193 lieutenants, 290 sub-lieutenants, and 378 midshipmen, they must be considered more from the point of view of what they might be than from that of what they are. An explanation is required as to the undue proportion of sub-lieutenants and midshipmen who have not undergone a twelve months' training. Is it due to the fact that they have not come forward, or is it that preference is given to officers of lieutenant's rank? If the latter be the case, is it not a faulty policy to allow officers to serve for a second twelve months' training, when so many have not served at all?

Few will find fault with the proposition that it is most desirable to encourage Reserve officers to serve for twelve months' training in the fleet, also to obtain certificates from the Gunnery and Torpedo Schools. To hold out an inducement above and beyond that already existing, it is suggested that there should be two classes of officers. The first-class Reserve officers' list to consist of lieutenants and sub-lieutenants who have served a year and also obtained gunnery and torpedo certificates. The second class to consist of lieutenants, sub-lieutenants, and midshipmen who have not done so.

The first-class officers to wear a distinctive uniform more closely resembling the Regular Service uniform than at present; for instance, the distinctive lace on the sleeves to be the same size as worn in the latter. The privilege of flying the blue ensign to be confined to officers on this list. The rank of retired commander could only be reached by first-class officers. The uniform of the second-class officers to remain as at present. This list would practically be probationary to the first-class list. Lieutenants and sub-lieutenants on the second-class list having completed the necessary qualifying services, etc., would be promoted to the first-class lieutenants' list. Midshipmen would under similar conditions be promoted to the first-class sub-lieutenants' list. A good inducement would thus be held out to sub-lieutenants and midshipmen to undergo training in the fleet. This is most desirable, for the latter ranks of officers are at an age to benefit most by the training.

Officers—Royal Marine.

On all sides regrets are heard that more use for naval purposes is not made of this highly-trained body of officers. Highly trained in the subjects which form the course of training, they no doubt are; but is it not in the training that the fault of their comparative inutility for naval work lies? If naval gunnery be omitted, the sea-training of the Marine officer is non-existent. Is it, therefore, surprising that on going afloat he finds himself handicapped at every turn of his career? May it be said that he is intensely bored; having no cope for his natural abilities, and more time on his hands than he knows what to do with, he suffers from that affliction which may be best described as mental discontent. So far as the officer himself is concerned a change in his training and consequently in his usefulness afloat would be beneficial. Looked at from the larger point of view of the Service the case is as bad. A Marine officer may be wanted to take charge of a boat; but how many of them are capable of this? A few, perhaps, from natural affinity and liking, but certainly none owing to any training they have received from the Service. Again, may not the Marine officer be wanted, lacking other officers, to take command of a prize, or, say, a tender, hurriedly commissioned for special service, and to navigate his charge to a port? It is feared that none could be found possessing the amount of knowledge of navigation necessary for either duty. History relates several instances of such duties falling to the lot of Marine officers in olden times.

The fact remains that much good material is being wasted for naval purposes; also that sea-service is not popular with the majority of Marine officers, many amongst the best of whom seek for employment on the staff of the Army, or as Volunteer adjutants, etc. It is thought that much might be done to remedy all this by paying more attention to the sea-training of the younger Marine officers. In the under-officered state of the Navy a specialist officer, incapable of being employed outside his speciality, is a luxury which cannot be afforded. The following proposals are made to effect the object in view:—

1. That whilst at Greenwich the probationary lieutenants (both R.M.A. and R.M.L.I.) should learn navigation and nautical astronomy.
2. That immediately on completion of the Greenwich course the officers should be drafted to sea, joining the gun-room mess, and being looked upon in all respects as midshipmen. Keeping watch, performing boat duties, studying the practice of navigation and learning the rudiments of gunnery and torpedo. One year would be so occupied.
3. On completion of one year at sea, the officers (both R.M.A. and R.M.L.I.) would join the "Excellent" and undergo the prescribed courses in gunnery and torpedo.
4. After the above the officers would be discharged to their respective headquarters for instruction in drill and military duties.

With such a start in naval training as this it would be the Marine officer's own fault if he did not take a greater interest in the all-round duties of a ship, and keep himself qualified to take part in any operations of a purely naval, or mixed naval and military character which the exigencies of the Service might require.

Some alteration of the rules under which Marine officers count sea-service seems to be required. Sea-service should mean service in a man-of-war at sea, under the same regulations as it counts for executive officers; speaking subject to correction, it is at present possible for a Marine officer to go through his whole career in the Service without once having served in a sea-going ship. A clear distinction should be made between the latter service and time served in First Reserve or harbour ships. In no case should a subaltern officer be drafted to any ship in either of the latter classes until he has served three years in a sea-going ship.

The necessity of drawing the bond which unites the Marines to the Naval Service tighter undoubtedly exists; the subject is one deserving the best consideration.

Engineer Officers.

The following table gives the number of officers of the Engineer Branch, which it is estimated are required to meet the wants of the fleet together with the numbers available :—

Rank.	Required for the Fleet.	Available.	Deficiency or Surplus.
Chief Inspectors and Inspectors of Machinery	13	13	Nil.
Fleet Engineers	150	105	−45
Staff „	135	93	−42
Chief „	110	74	−36
Engineers	342	289	−53
Assistant Engineers	258	182	−76
Engineers' Temporary Service ..	—	15	+15
Total ..	1,008	771	−237

In addition to the numbers available, 172 engineer students were under training at the beginning of the year. Credit may be given for those who have completed the third year's course of instruction at the Engineer College, as at a pinch they might assist in performing duties falling to assistant engineers. From this source the available numbers can be increased by about seventy officers. Hence the position stands thus, viz., that the engineer officers' list, of all ranks, shows a deficiency in round numbers of 170.

The abolition of the "Marlborough" training-ship and the inability of the Engineer College at Keyham to cope with the increased numbers of engineer students had the effect of reducing the entries. The extension

of the latter college now being undertaken will enable increased numbers of students to be entered, when it is to be hoped that the engineer officers' list will be brought up to the full requirements of the Service. For to depend on direct entry from the outside trade appears to be a false policy. It was stated in the First Lord's memorandum attached to the Estimates of this year, that provision was made for the entry of forty engineers for temporary service. Up to the 1st July of the present year only fifteen of such officers are borne, twelve having entered in 1894 and three in the present year. It is evident, therefore, that some bar exists, which prevents suitable candidates from presenting themselves. Several explanations have been, from time to time, given of this. Some say that the social problem it at the bottom of it all, but this is open to doubt; if the social shoe pinches in any respect, let the fault, in the interest of good fellowship and *camaraderie*, be remedied. A ward-room mess is a bohemian society, taking a man for his individual worth—there is little of class caste about it. The difficulty appears to be one of money, for it must be remembered that engineering is a trade profession, and has its value in the market. A man has to invest capital in order to acquire his profession; having done so, he looks for employment where he will obtain the greatest return for his outlay. The pay offered to assistant engineers for temporary service is £136 per annum; his messing, etc., will cost about £60 per annum, leaving about £76 out of which he has to provide uniform, etc.; a very small surplus remains to meet other calls which may fall upon him. An engineer on shore, if a single man, can live on the same amount which it costs him to live on board ship, and he has not the expense of uniform to meet; if he is a married man, the Service pay appears in a much worse light. To get competent men from the trade a much higher remuneration than that now offered will have to be given. It is not in the interests of the country or the Service that they should be brought into competition with the market rate of pay. It has the bad effect of causing dissatisfaction amongst the officers on the regular list, who are led to contrast their position with other members of their profession outside, forgetting at the time what an important item in the consideration the prospect of a pension is. Considering the very important duties that fall to naval engineer officers, there can be no question that the true policy for the country to follow, and the cheapest in the end, is to train her own engineer officers, and not to look outside for any help.

Engineer Officers.—Royal Naval Reserve.

On the list of the Royal Naval Reserve there are 114 engineers and 52 assistant engineers, making in all 166. It is difficult for a naval officer to write on this subject, for these officers are altogether unknown to the Navy. It has been urged, by competent writers, that Reserve engineers should be induced to serve for a year's training in the Navy. That such a course is very necessary, scarcely admits of a doubt. As the matter stands, the Reserve officers may be suitable for employment in cruisers and smaller vessels, where the work is almost completely

confined to driving the ship and the care and maintenance of the main engines, etc. It is open to doubt if they would be of much value in a battle-ship, with the many auxiliary engines and machines, which have no counterpart in the mercantile marine, to look after. It does not appear desirable to thus confine officers to employment in particular classes of vessels; the inevitable result would be confusion in mobilisation.

Medical Officers.

The past record of the Red Cross and other kindred societies show that the medical profession are not backward in responding to the call of duty. There is no reason to suppose that any difficulty will be met in augmenting the number of medical officers to any extent required, but it is not well to leave anything to chance; and moreover, it is not every man, especially those who have passed into middle age, who is suitable for a sea-life, even as a medical officer. On these grounds, the formation of a Reserve of medical officers is urged. No training, beyond obtaining an insight into life on board ship would be required. This requirement can be met by making it a condition of retention on the list, that every Reserve medical officer on joining should serve for three months in a sea-going ship of war, and afterwards should similarly serve, say, for six weeks once in every four years. From this Reserve List the Navy would be certain of getting men who have, in some measure, acquired knowledge of the habits of the men who might fall under their care, as well as the surroundings in which they have to work.

Naval Instructors and the Training of Junior Officers Afloat.

As a general rule, the duties of chaplain and naval instructor are combined. With the limited accommodation on board modern ships, it is well that it should be so, as the duties in no way clash. Naval instructors are well trained for the work they have to do, and are zealous in its performance. Perhaps some commanding officers think too much so, when it becomes a question of school or boat duty. Intimately connected with the subject of naval instructors, is that of the training of junior officers afloat. This latter subject is a much vexed one, and in the opinion of many officers is not at all satisfactory. They contend that the time afloat, which is spent at school, might with more advantage be employed in learning professional duties. However much sympathy may be felt for this view, it must be recognised that, under our present system of entering junior officers, to be partly educated in the "Britannia," partly afloat and partly at Greenwich, some large portion of the time afloat must be devoted to purely educational studies—short of a complete alteration in the method of entering and training junior officers, there is no help for it. It only remains to employ the remainder of the time afloat to the best possible advantage in practising professional duties.

Concluding Remarks.

The subject selected for the Prize Essay of 1895 is one of the most vital importance, not only to the Naval Service, but to the whole of the

Empire. For in it is involved the general question of the training of Great Britain's maritime population. With our Navy starved for both officers and men, our mercantile marine, through the operation of economic laws, rapidly falling into the hands of foreigners, it will be readily conceded that the selection of such a subject by the Council of the United Service Institution is most opportune. The *personnel* question has, in the past, not received that public attention which is its due. We build war-ships embodying all the improvements that naval war architecture can devise; we build magnificent merchant vessels which are the envy of the world, it is well and right that this should be so; but the fact that, without officers and crews, these vessels, magnificent and grand though they may be, are nothing more than inanimate monuments to the progress of naval architecture, seems to have been overlooked, or left to chance to remedy itself. It would seem that England has forgotten that her prosperity, under Providence, is due to the past deeds of her Navy and her mercantile marine, or, in other words, to the pre-eminence of her seamen. That this pre-eminence, speaking of the country generally, is in danger of passing away, there is, it is feared, grave reason for believing. It is time that the country awakened to a sense of her responsibility in the matter, and by legislation restored the training of her sea population to the position it occupied before the abolition of the Navigation Laws. The Council of the United Service Institution have, by their selection, opened a door through which opinions, inside and outside the Naval Service, can be heard; in having done so, they deserve the lasting gratitude of the country.

ESSAY FOR GOLD MEDAL COMPETITION, No. 8*

(Honourably mentioned and recommended to be printed by the Referees).

Subject:

"IN VIEW OF THE CHANGES WHICH HAVE TAKEN PLACE IN THE COMPOSITION OF FLEETS DURING THE PRESENT CENTURY, WHAT SYSTEM OF ENTRY, TRAINING, AND DISTRIBUTION IS BEST CALCULATED TO ENSURE AN EFFICIENT BODY OF OFFICERS AND MEN OF ALL BRANCHES FOR A PEACE AND WAR ESTABLISHMENT?"

By Captain S. M. EARDLEY-WILMOT, R.N.

"All who have meditated on the art of governing mankind have been convinced that the fate of Empires depends on the education of youth."

IN setting the above subject for an essay, it is to be presumed the Council of this Institution considered that the changes in the composition of fleets might necessitate modifications in the system under which they are manned—a system which in our case had its origin, both as regards officers and men, in a very different state of affairs than now prevails, whether we consider the ships themselves, or the weapons with which they are equipped.

To such a view all must assent, because we continually see around us how necessary it is to adapt the human mind and body in other respects to those changes which the progress of civilisation and science produce in every-day life. Moreover, in no branch of national life has there been such marvellous changes as in those naval armaments which all States with a sea coast have acquired, or are seeking to possess. The word "change" is quite inadequate to convey any appreciation of what has been effected in the construction, equipment, and propulsion of those craft which now traverse the seas, either in the service of the State, or for commercial enterprise. It is a complete revolution, because of the brief period which has sufficed for its accomplishment.

Reviewing the history of shipping from earliest times transmitted in the imperfect records handed down to us, we observe that though each succeeding century saw some advance in size, some improvement in seaworthiness or sailing qualities, some less crude method adopted for discharging ordnance, none were sufficiently noteworthy to mark an epoch; and hence it is usual to say that the ships at Trafalgar only differed slightly from those which under Blake engaged the Dutch one hundred and fifty years previously.

* NOTE.—This Essay being second on the list for merit, the second Gascoigne Prize of twenty guineas was awarded to Captain S. M. Eardley-Wilmot.

This tardy development of naval science continued up to, and beyond, the first great change when steam-power was successfully applied to the propulsion of ships, because the importance of this step was not recognised. A great and ancient calling is not easily severed from methods and traditions handed down from many generations—methods, moreover, which had proved uniformly successful. Even the most advanced of naval minds could not at that time look upon steam as more than an auxiliary to movement at sea, and only to be called into operation on special occasions. It was to be a beast of burden, and applied only to craft whose mission would be to tow the fighting-ships into the presence of the enemy when the fickle wind deserted them. After the action they could take in tow disabled vessels and secure the prizes.

A more advanced view was that which attributed to steam-ships the part which cavalry plays to an army: seeking out the enemy, and then retiring behind the main body when the two fleets came in contact.

Such were some of the ideas which prevailed when the paddle-wheel vessel made her appearance, and they did not depart when the paddle was superseded by the screw propeller. In this case a prompt recognition of its value among naval authorities was retarded by a belief that acting at the stern of a vessel the steering qualities would be affected. This appealed strongly to the seamen of that day.

Hence the growth of steam in ships-of-war was far from rapid, and as there seemed little demand for advance in other directions it was not accompanied by great changes in construction, or striking improvements in ordnance. During the Crimean War, and up to the year 1860, the wooden walls and the smooth-bore gun still represented the sea-power of nations. It was during this period also that we created the system by which our fleet is manned, and established the training school which provides us with officers. The methods adopted could not fail to reflect the minds of the seamen of that day, and be influenced by the traditions existing then as to what the training for a naval career should be, seeing that the changes which had come during their time had not fundamentally altered the handling or fighting of fleets.

In the year 1860 began the revolution which has transformed entirely the sea-service. During the thirty-five years which have elapsed we have frankly recognised the value of steam, and developed its power to such an extent that masts and sails in war-ships have almost disappeared. By rifling the bore of cannon we have increased the accuracy of projectiles, and this has been further enhanced by progressive improvements both in the guns themselves and the explosives employed. Advance in the application of mechanical science to the arts of war now enables us to mount and work with ease ordnance of immense weight. This led us to confide the issue of a sea fight to four monster guns—as represented in the "Inflexible"—in place of the one hundred and thirty smooth bores, which, in 1860, our flag-ship in the Mediterranean carried.

The terrible effect of shell fire upon wooden ships caused not only the substitution of iron for wood in the hull, but created the ironclad carrying an immense weight of protective armour.

Having produced a heavy mass propelled by a power which was not only constant but enabled the direction to be changed at will, it was natural to utilise its capabilities as a ram, and thus revert to a weapon of early naval history.

Then came the birth of the torpedo, a weapon directed at the most vulnerable part of modern ships, its construction and application embodying the highest degree of mechanical skill and human training. It was indeed a revolution which occurred between 1860 and 1880 in the material of fleets, demanding qualities of those entrusted with the handling of the new weapons of a different nature to what had formerly sufficed. How far we have gone to meet this altered condition of affairs must now be considered.

OFFICERS.

Entry and Training.

It has always been a special feature of the naval profession that officers entered it at an earlier age than any other. This feature is retained up to the present day, and differs, moreover, from the general custom which prevails with other nations. Thus, while the age of entry for naval cadets with us has kept fairly constant for nearly 100 years, at from twelve-and-a-half to fourteen-and-a-half, in most other Navies boys are not usually taken from the ordinary schools of the country for naval training till they are over fifteen.

Before dealing with our own plan, it will be instructive to describe briefly the regulations on this head carried out in some of the other States.

In France, entry to the Naval School is by open competition; the conditions being: French nationality, age between fourteen and eighteen, and a declaration from parents of willingness to pay the required sums if admitted to the school. The examinations take place simultaneously at different naval towns, and the papers set include arithmetic, algebra, geometry and trigonometry. Other subjects are dealt with *vivâ voce*. Among them are statics, physics, and chemistry. Vacancies in the Naval School are filled by order of merit in this examination. As may be gathered, the test is a severe one of scholastic knowledge and general educational attainments. From the age limits allowed it follows that boys seldom compete till after they are sixteen, and the average age for entering the Navy is about seventeen. They have then received a good general education, and are well grounded in those subjects, the higher branches of which they can study in the training-ship.

Like ourselves, the French have retained a hulk for a cadets' training-ship, which is established on a three-decker—the "Borda"—at Brest. The course lasts for two years, and combines general and technical instruction.

The scholastic education is completed by an advanced course of mathematics, literature, and languages. They are instructed also in the theory of gunnery, explosives, and naval architecture—seamanship is taught as well as the handling of guns and small arms. Navigation and steam are also learnt here. It is obvious that all these subjects could not

be assimilated unless the boys had first been well grounded at school, and their undoubted high standard in mathematics on passing out of the training-ship is attributable to this fact. Nor can it be said that the practical part of their training is neglected, for there are sea-going tenders attached to the "Borda," on which the cadets embark periodically for exercise.

At the end of their course the cadets are examined and classified in order of merit. They then embark in a sea-going training-ship for a ten months' cruise. Here they are instructed in all the duties of an officer, and finally pass out as midshipmen first class. They are then, on an average, about twenty years old. It may be considered that this is an advanced age to join a regular man-of-war, but French officers do not consider it advisable to lower the age of entry, or interrupt sooner their education at their lycées. By this system no further instruction is required in sea-going ships, but the midshipman first class at once falls into duty and performs similar functions afloat to our sub-lieutenant.

The result is that the French naval officers are a highly educated body of men, fully capable of dealing with the scientific problems connected with modern naval architecture and ordnance. Whether this result is attained at some sacrifice of the practical qualities, and early acquaintance with responsibility, it is difficult to say; but French naval officers appear satisfied that the system could not be materially altered with advantage.

In Russia, the age of entry is earlier, between twelve and fifteen, but the course at the Naval School extends over five years. During the winter months the time is devoted to study, but in the summer the cadets are embarked and practically trained in the duties of their profession. At the completion of this course there is an examination, and those successful are sent in a sea-going training-ship on a distant cruise. There is a final examination before the young officer takes his place in the fleet. The training given is very thorough, though to us it may seem that the time in the Naval School is unduly prolonged.

Though small, the Austrian Navy is acknowledged to be very efficient in all respects. It has taken part in the only war in which squadrons of modern ships were engaged. The result was creditable to the Austrian fleet, and its officers displayed on this occasion both skill and gallantry. There has since been no falling off in efficiency, and hence it is interesting to note the system of training adopted by this State.

To enter the Austrian Navy no nomination is required, and thus the Service is practically open to all; but the payment required of parents for the training afterwards limits the competitors to a certain class. They must also have attained to a certain standard in the schools of the country, and be not under fifteen or over seventeen years of age. This standard is sufficient to ensure entry; for the examination which follows to pass into the Navy is more of a test to ensure that this amount of knowledge has been acquired. A selection is then made by the naval authorities to fill the vacancies. To a proportion of each batch are given scholarships, which carry training gratis at the Naval Academy. These are in most

cases sons of officers in the Army and Navy. The selected candidates then join the Naval Academy between the ages of fifteen and sixteen, and remain there four years. For the first two years their education is advanced towards the higher mathematics and those subjects bearing upon the naval profession. At the same time they are learning the rudiments of a sea life, for which purpose boats, etc., are attached to the School. All embark also in a training-ship for three months during the summer. During the last two years of the course the book work is diminished, and more time given to seamanship and practical subjects.

At the end of the four years the cadets are sent to a sea-going ship, where certain officers are detailed to instruct them in turn in the different duties of a naval officer, watch keeping, navigation, gunnery, torpedo, etc. At the end of the cruise they are distributed among the ships of the fleet, and become sub-lieutenants two years after leaving the Academy.

As regards this system, I have found a doubt among Austrian naval officers whether it is advisable to have so long a period at the School as four years. It is urged that if it was reduced to two years, and young officers went to sea earlier, they would gain in practical knowledge, while they could later study the more advanced subjects which they do during the last two years of their stay at the Academy. Whether the mind and body being more developed later they would have greater capacity then of close study, is open to argument; but it is significant that in one Navy at least we find some support to our preference for a less stringent course of study in the earlier stages of an officer's career.

In the United States, the training at the Naval Academy at Annapolis lasts six years, and naturally a high standard in scholastic subjects is attained.

Though there is a cruise every summer in which a knowledge of sea life is acquired, it seems undesirable to delay so long a young officer taking up those regular duties in the fleet which fall to our senior midshipmen and sub-lieutenants.

It is now time to consider our own system, and whether some modification is not desirable. That doubts have at times arisen as to its value, is demonstrated by the number of committees which have considered the subject. The last was that held in 1885, and presided over by Admiral Luard.

Up to the close of the old war, the entry of officers appears to have been irregular; but in 1816, the age was fixed at from twelve-and-a-half to fourteen years. Entry was by nomination and a test examination. A naval college at Portsmouth then existed, and some of the cadets remained there two years before going to sea. In 1837 this was discontinued, and all went straight to sea. This lasted till 1857, when the present system was started with the training-ship "Illustrious." The age of entry was then fixed at thirteen to fifteen. In 1859, it was changed to twelve and fourteen, and the following year to twelve and thirteen-and-a-half.

Towards the close of 1859, the "Britannia" was substituted for the "Illustrious," and stationed at Portsmouth harbour where the "St. Vincent" now lies. The course of instruction, which in the "Illus-

trious" had been six and nine months, was extended in the "Britannia" to fifteen months. In 1862 the ship was moved to Portland, and in 1863 to Dartmouth. In 1869 the course of training on board was increased to two years, and the age of admission has been altered to thirteen and fourteen-and-a-half. The system of entries is by nomination and limited competition, that is to say, three nominations are given for every vacancy. The successful competitors join the "Britannia" when they are just upon fourteen years of age, and remain there two years when, after examination, they go straight to sea as cadets and midshipmen. As at sixteen their scholastic education can hardly be considered complete, it is continued at sea by naval instructors, who strive to advance the knowledge of their young pupils amid the distractions of sea life. Three years later they pass in seamanship for lieutenant, and then have to join the Naval College at Greenwich, where, in three months, it is sought to make up for the deficiencies of the past three years, and impart that knowledge of elementary mathematics which should have been acquired either at school or in a training-ship.

On the other hand, during that three years in a seafaring-ship as midshipman, the young officer has early imbibed sense of responsibility, some practical knowledge of handling men, and some acquaintance with modern seamanship, picked up haphazard, and when he could be released from the oft-pressed claims of the naval instructor. Under such conditions, it is a source of wonder to most that our young officers turn out so well. As has been said by foreign critics, they are what they are in spite of—not owing to—their early training.

But the Navy is essentially a practical profession, demanding of those who embark in it qualities which, to ensure efficiency in the general mass, do not require high mental development. Nerve and confidence in handling ships may be allied to an incapacity for mathematics, but will nevertheless be more generally useful in the ordinary peace routine of a ship, or on the day of battle.

That something, however, is deficient in the early training of our officers is evident from the observations of those who, in the command of ironclads and cruisers, have been brought in contact with midshipmen after they have left the training-ship. They usually first go to an ironclad and latterly spend a year in the training squadron. An officer in command of one of the ships of the latter expressed to me in strong terms the deficiency he had observed in the general education of midshipmen in his ship, and also that in some cases they could not even work the reckoning. As regards the former charge, I can only attribute it to the system of "cram" which now prevails, to the detriment of solid education. To enter the "Britannia"—unless a boy is exceptionally brilliant—he is removed from his ordinary school to a special establishment some time previously, where all efforts are directed to cramming him with what is necessary for grappling with the special subjects of the examination. Ordinary education has ceased, and when my friend asked a midshipman who Tasso was, and received for a reply that it was the name of a river, he perhaps expected too much general knowledge under the circumstances.

But I am afraid this system of cram does not stop at the preparation for entry. From all accounts it is continued in the "Britannia," the main aim and object there being to show a good result on paper at the final examinations. Too much is attempted there, and boys have to grapple with subjects for which their previous education has not qualified them. Had they remained two years longer at an ordinary school, it would not be necessary afterwards to begin at elementary mathematics, and neglect geography and history. A naval training establishment is not for the purpose of teaching those things which are learnt at any Board School, but for imparting a knowledge of advanced subjects, and those directly connected with their particular profession.

Thus, mentally ill-equipped, a boy goes to sea at sixteen, and for the next three years endeavours to advance the theoretical knowledge he has attained. The effect of insufficient grounding is then seen, and though stringent regulations have been promulgated that nothing must interfere with the young gentlemen's school, very little, if any, advance is made. How could it be otherwise knowing what study demands, and what are the conditions of a ship? Absolute quiet being essential, where can it be obtained afloat?

Interruption being detrimental to progress, how can it be avoided with the ordinary routine of a ship, which gives these lads positions of command, from which they cannot absent themselves without losing experience which is probably more valuable. All who have studied the question have been struck with the incompatibility, if not impossibility, of endeavouring to combine the work of a schoolboy with the position of an officer.

In 1870 a committee, presided over by Admiral Shadwell, C.B., which included Captains Richards and Hood, then respectively Hydrographer and Director of Naval Ordnance, on the higher education of naval officers reported that:—"The general bearing of the evidence of naval instructors and other officers, with respect to the efficiency of the instruction on board sea-going ships goes to establish the fact that the present system is very imperfect, and does little, if anything, towards keeping up, still less towards extending, the knowledge of young naval officers in any subject, but those which are absolutely necessary for passing the examinations in navigation at the Royal Naval College." The remedy proposed by this committee was to extend the stay of the cadets on the "Britannia" to four years, the last year being specially devoted to cruises in training-brigs. After this course it was considered that naval instructors in sea-going ships might be discontinued.

This proposal to extend the training course was not adopted, but fifteen years later another committee was appointed to report on the education of naval executive officers. The points to be considered were:—The age and entry into the "Britannia"; the course of study on board that ship; the training of midshipmen at sea, and the course of study for gunnery and torpedo lieutenants and sub-lieutenants. The President was Admiral Luard; Commander the Earl of Dalhousie, who had served in the "Britannia," was a member, and also Captain Charles

Johnstone. A number of officers gave evidence before this committee, to whose opinions I shall presently refer, and its report advocated sweeping changes in the method of entering and training officers for the Navy. Summarised, they were as follows:—Boys to be drawn from the public schools, a first selection being made about the age of fifteen by a test examination. The selected candidates then to have a special education for a year. A final examination to then take place, and those successful to join the "Britannia" at about sixteen years old. To remain there one year. The "Britannia" to be moved to Portsmouth and have small vessels attached to her. The instruction in the "Britannia" to be chiefly technical and nautical. At about the age of seventeen, cadets to join a sea-going ship, and be instructed in practical duties by special officers. No more theoretical instruction, and naval instructors to be abolished. At about the age of twenty, midshipman to pass for sub-lieutenant. That classes in the different subjects be abolished, and a sub-lieutenant not to be promoted till he had served two years in that grade. The committee concludes its report by saying:—"We have been deeply impressed throughout our enquiry by the universality of the conviction that the time has come when some such changes, as we have recommended, can no longer be safely delayed; and we, therefore, in our concluding words, venture to press upon their lordships our sense of the urgency of the whole question of naval education, and our hope that the reforms we have recommended may be speedily carried out." This was in 1886, but few of the proposals were adopted.

Now, in considering this report and the evidence which supported it, able as it undoubtedly is, going to the root of the matter in a manner which had never been attempted before, one is struck by certain incongruities which mar, to some extent, its effect. To carry out their first proposal — that of drawing their material from public schools — the committee advocate total abolition of the nomination system, and the adoption of open competition. In this I concur. To those parents wishing to send their boy to sea, but unacquainted with the profession, the difficulty of obtaining a nomination is magnified, and ignorance of the procedure involved may deter them from taking any step in the matter. But there is a stronger reason. By adopting open competition we should not get cleverer individual boys, but there would not be such an indifferent tail as at present. The general average would be higher: I do not think it would injuriously affect the class of boy obtained, as it has not done so in the Army. Professions are recruited in officers by certain branches of society which remain constant. It is certainly so as regards the Navy, and open competition would not cause a change in this respect. I cannot however, go with the committee in limiting the selection to public schools. Why should any school be debarred from contributing boys to the Navy? Admittance to a public school involves heavy expense on parents: let all educational establishments be here on equal terms, and as few restrictions as possible placed on the privilege of entering the Navy.

Coming to the age of entry, though I am all for boys embarking

young upon a naval career, I think there is no necessity for removing them from their ordinary education till the age of sixteen, and would make the age for competition from fifteen to seventeen. The testimony before the committee was very strong on this point. Captain Kane, who was then Naval Attaché, said that in some foreign navies officers, owing to their being entered later, were better educated than our own, and were, he considered, more efficient as officers. He especially extolled German naval officers and their system of training. They, in characteristic fashion, ensure that everyone should acquire every part of the necessary knowledge; while we, in characteristic English fashion, trust to officers picking up knowledge haphazard. As for the system of naval instructors in sea-going ships, Captain Kane held that it had completely failed, and he would sweep it away altogether.

Equally strong opinions were expressed by Captain H. F. Nicholson. He said: "Any attempt to pursue a successful scholastic course on board a ship must be necessarily accompanied by immense difficulties, which it is almost impossible to overcome. . . . . I look upon the whole system as a complete failure, and nothing but the natural taste which the English boy has for the sea, and the instruction he has previously received on board the 'Britannia,' enable him to turn out even a decently educated naval officer. In my experience as Naval Attaché I have been very much struck with the deplorable comparison, as regards education, between our Navy and some other Navies. I think there is no doubt whatever that in any important matter, such as the education of officers, where you find the whole of Europe differing in opinion from you, you may begin to view your position with considerable mistrust, and that in nine cases out of ten you will find that you are in the wrong. The system in all foreign Navies is that the officers should be thoroughly grounded and taught at colleges, the only exception, as far as I know, being in France, where they are taught on board ship in the harbour of Brest." His view was that whatever number of young officers were required, should enter by open competition between the age of seventeen and eighteen. They should be attached to a technical training establishment for two years to learn professional subjects. Having passed the required examinations they would go to sea as acting sub-lieutenants, and after one year be confirmed in that rank. This abolishes midshipmen afloat, and Captain Nicholson considered this would eventually come under any conditions by the want of accommodation in modern ships for these officers.

Captain Bowden-Smith, then in command of the "Britannia," did not, however, take the same view. He was in favour of officers coming to sea at an early age. It was an unnatural life, and, in his opinion, our officers as it is now compare very favourably with foreign officers by carrying out our present system. But he considered a college on shore would be more suitable than the "Britannia," provided it was near the water, where boating and swimming could be obtained. The greatest drawbacks to the ship were the draughts in winter. From an educational point of view, the chief naval instructor also considered that a college

would be superior. The value of the "Britannia"—said the captain of the ship—consisted chiefly in giving the cadets some experience of naval life. They slept in hammocks, went up and down ladders, and learnt the names of ropes, etc.

Of course, it must be remembered that when the "Britannia" was instituted she assimilated to the ships then in the Navy. We had two and three deckers on nearly all stations. She was rigged to some extent, and her internal fittings then bore some resemblance to a man-of-war. This has now all departed, and the "Britannia" is simply an obsolete hulk, having very slight connection with modern sea conditions.

Moreover, any chance the cadets might have of becoming acquainted with the ships in which they will hereafter serve is lost by the locality selected for their training. The writer, who was in the "Britannia" when stationed at Portsmouth, has a vivid recollection of the pleasure afforded there by frequent visits to the dockyard and ships in the harbour. Vessels arriving from, and departing to, foreign stations were objects of the keenest interest; their officers, of respect and admiration. Portsmouth was, and is, the great centre of naval activity and progress. No models or books can give such an acquaintance with the peculiarities of modern naval construction, progress in gunnery or development of torpedo attack, as personal observation. A naval educational establishment is best located at this port, and I consider a great mistake was made in removing it first to Portland and then to Dartmouth. At the latter place the cadets are isolated from the profession they are about to enter, and only meet the few officers attached to the ship. For boat-sailing the facilities cannot compare with those afforded by the Solent. The reasons usually given for withdrawing the "Britannia" from Portsmouth were that the close proximity of a garrison town was detrimental to the morals of the boys, and that the locality did not afford sufficient facilities for exercise on shore. As regards the first point, there might at that time have existed a condition of things at Portsmouth which was undesirable for boys with any predisposition to vice; but from experience I can affirm that the general mass were unaffected by their surroundings. Moreover, Portsmouth to-day is very different to what it was five-and-thirty years ago. There was perhaps some force in the absence of ground, and difficulty of getting into the country without having to pass through a considerable expanse of town. In this respect, the present location of Dartmouth has great advantages.

It would seem to me, however, that we could retain the essential condition of being close to a naval arsenal, have the benefit of the country close at hand, and secure water space suitable for all forms of boating, by acquiring the land, and building a suitable college on the North side of the Isle of Wight. The most suitable position would appear to be in the vicinity of Wootton Creek, West of Ryde. At the back is magnificent country, while in front there stretches one of the finest enclosed bits of water to be found anywhere. On it boat-sailing and the rudiments of pilotage would be acquired under most favourable conditions, while a practical knowledge of steam could be equally well

imparted. A fast steam-launch would convey the cadets to Portsmouth in a short time, where an afternoon could be occasionally devoted to a visit to the dockyard, gunnery or torpedo-training establishments. They would see ships of every class in course of construction, and thus be able to follow with more intelligence lectures on naval architecture. At present few naval officers have the opportunity of observing this work. They would gain some familiarity with ordnance of all kinds in seeing it placed on board. The same may be said as regards the various types of boilers and propelling machinery. How much more interesting then would become their theoretical instruction in these subjects, illustrated by diagram and model! If, as some contend, the sea is an unnatural life requiring great enthusiasm to insure its prosecution, how important to bring all that is interesting in a naval career thus early before the mind! What an advantage on first embarking in a sea-going ship to find the surrounding objects not quite unfamiliar! We, who went to sea in the sixties, found nothing strange in the line-of-battle-ships or frigates we went to. We had thoroughly explored from upper deck to keel many of similar type as they lay dismantled in Portsmouth Harbour. It was one of our delights to run alongside a hulk and dive down to the lowest depths, wondering which side of the tiers we should find the big hemp hawser. Would there not be as great interest now in similar excursions to modern ships, and why should not our future naval officers have the same privilege?

I have mentioned the North side of the Isle of Wight as the best site for a college, but if insuperable difficulties were met in locating it there, another site might be found in the other side of the Solent, such as the mouth of the Hamble River. This, however, is further off the harbour.

The drawback to any part of Portsmouth Harbour itself is the strong tides, which are so disadvantageous for boating. If it were decided to have a college—and the "Britannia" cannot last for ever—a good position could doubtless be found.

The system of entry recommended in accordance with the foregoing remarks, is by open competition at from fifteen to seventeen years of age. The examination should be a test of general education in which mathematics and languages are given a somewhat prominent position. This cannot be avoided. For the legal or clerical professions a greater acquaintance with the classics is essential, while they are not indispensable to a naval officer. It is desirable, however, that the necessity for cramming should be avoided, and that any school which has a *bonâ fide* modern side may submit its pupils with confidence. A great endeavour should be made to improve the knowledge of languages in the Navy, and this can only be properly acquired at an early age. Hence it is made an important item in the examination for entry. The choice should be between French and German. I see no reason to alter the arrangements under which Colonial and Service Cadet-ships are given, except in some re-adjustment of the test examination. It might take the form of a minimum in all subjects. I assume that with the age of competition advanced, the majority would enter at about fifteen-and-a-half,

while more backward boys would wait until later. A second trial should be allowed in case of failure and if within the age limits, but no more. Successful candidates should then go to the training college for eighteen months. The first year would be devoted to higher instruction in mathematics and its various branches, with the theory of navigation and nautical astronomy. A certain portion of the time would also be given to the rudiments of seamanship. Something in the shape of a hulk afloat or ashore would be necessary. Those who have seen the ship in the grounds of Greenwich School know how much can be done with such an appliance. The summer would be the principal time for boat-work. During the last six months there would be less study and more time given to professional subjects. A sloop or small corvette should be attached to the college, in which the senior cadets could make cruises of a week or more duration.

Captain Bowden-Smith, in his evidence before Admiral Luard's Committee, referred to the disarrangement of classes caused by the cadets going out for the day in the "Wave," and doubted if it was worth while just for taking sights. He thought, however, she would be useful for teaching the cadets pilotage, if they were on board for a long period. To the question, "You would like to take the boys to sea for a week together, rather than for a day at a time?" he replied, "I think they would learn more if they could go out in that way: they would learn something of the Channel and the important headlands, and they might learn something of the steam-engine." Under the present system, by which working at high pressure is necessary to attain an ideal, theoretical standard, little time can be spared towards that practical knowledge which a week at sea occasionally would go far to secure. By the system advocated of delaying the entry for eighteen months, a sufficiently high standard in theoretical knowledge should be reached on completion of first year in training establishment, to enable the concluding portion to be more particularly devoted to professional subjects. Having concluded the eighteen months' course, the cadets would pass out at about seventeen years of age with a good scholastic education and a fair knowledge of all matters connected with their profession. Their nautical training cannot, however, be considered complete at this stage.

At the present time a midshipman in a sea-going ship is not unfrequently stationed at a voice tube, as if this ensured a more correct transmission of the message than if the duty had been confided to an intelligent seaman or Marine; but the young officer is probably thereby debarred from personal observation of interesting evolutions or working of the ordnance. In another instance, he may be attached as aide-de-camp to the commander, and his most important office be carrying messages from one part of the ship to another. There is no systematic teaching of his profession to the midshipman of sixteen years old who now goes from one school in harbour to another at sea until the time comes for him to pass for sub-lieutenant. What is the result then? Instead of the time in this grade being chiefly spent at sea, the young officer has to devote some

months at Greenwich to an elementary course of study, which should be quite unnecessary in this stage of his career.

We have next to consider the further training of the cadet on leaving the Academy. On this point the highest authorities differ. Many would send him to ordinary ships as at present, but without a naval instructor, so that his time might be freely given to practical work. Mr. Oborn, a naval instructor of long experience in sea-going ships and at Greenwich, expressed an opinion before Admiral Luard's Committee that with a sound knowledge of mathematics, cadets might go to sea at the age of sixteen or sixteen-and-a-half, and dispense with the service of a naval instructor. I think myself, however, that it would be difficult to secure systematic training for young officers amid the station routine of a squadron. In view also of the further knowledge in many subjects to be hereafter taken up—for gunnery and torpedo lieutenants for example—all theoretical instructions could not be dropped at this age. The almost universal custom abroad of a special sea-going ship making a distant cruise seems the only practical way of securing what is required. With us a training squadron could, and should, complete what has been done at the Academy. This seems preferable to massing a number of boys on a single vessel. But our present squadron so employed is inadequate for the training of our officers or seamen; only a portion pass through it. A second should be equipped, and in the vessels of the "Comus" class we have craft which, ineffective owing to want of speed for ordinary service, are well suited for the purpose indicated.

The cruise should last for about nine months, during which time the cadets would go through a regular course of instruction in seamanship, gunnery, navigation, and steam. They would also in turn perform the duties of officer of the watch, carrying out steam tactics and obtaining a thorough knowledge of signals. At the termination of the cruise they should undergo an examination for the rank of sub-lieutenant, promotion to which would follow in due course after appointment to and service in ordinary ships of the fleet for a certain time as midshipmen.

Their age on completing training would be about eighteen. They could then take a part in the work of the ship, and there would be no further necessity for a naval instructor. By the result of the examination out of the training squadron, and reports of commanding officer as to officer-like qualities afloat, the time before being promoted to sub-lieutenant would be regulated, but the age would vary from nineteen to twenty-one, and practically it would not differ much from the present average.

The effect of such a system would be that the education and training of the young officer becomes progressive and continuous up to the age of eighteen. Many would keep him under tuition until later, but I am of opinion that the advantage of his having responsibility and taking a share in the work of a sea-going ship should be no longer delayed. This is in itself such valuable training when unembarrassed by the demands of school, that I desire to see those distinctive attributes, which in a great measure characterise the British naval officer as a result of his early entry,

still in a great measure maintained. I do not think they will disappear by a midshipman joining a sea-going ship two years later than at present; but in any case the change seems imperative. There is another point which fortifies my desire not to attempt to reach too high a standard of theoretical knowledge at this early period. It is the opinion I find among many naval officers of our own and other Services that this advance is best attained later by what they term post-graduate courses. Our system of officers returning to Greenwich for study as lieutenants is considered to have many advantages. At this age the mind is better able to assimilate certain branches of knowledge, and the student appreciates in a higher degree its advantages. Unfortunately it is marred in our case by insufficient grounding at the beginning, so that time is lost in endeavouring to make up for this defect. With this overcome by the preliminary education being completed before entering upon a sea life, the officer would, on going to Greenwich, afterwards be in a position at once to take up the special subject he desired to study. It was for such a purpose, and as a result of the report of a Committee on the Higher Education of Naval Officers, that the Naval College at Greenwich was instituted; but it has never yet been able to carry out any such functions, for the main portion of its work hitherto has been that of an elementary school dealing with those subjects which should have been mastered years previously.

I have dwelt at considerable length on this question of early entry and training because of its importance. Education is the apprenticeship of life, and to the mind what sculpture is to a block of marble. Progress and efficiency afterwards are dependent chiefly on experience and practice. It is these give aptitude in handling ships, and that our officers show proficiency in this greater, perhaps, than in most other Navies, is due, doubtless, to the number of vessels we employ and the time they spend at sea. It can hardly be attributed to the fact that they enter the Navy earlier, for up to the age of eighteen they now do little that can help to acquire such proficiency.

There is one species of practice which forms most valuable experience for the young naval officer. It is the handling of torpedo-boats. The manipulation of such craft at high speed develops all the faculties which will hereafter tell in the handling of ships. We do not take sufficient advantage of this. At the principal ports there should always be a certain number of torpedo-boats in commission for instruction, and training officers in their use. Every sub-lieutenant should go through a torpedo-boat course.

In the system I have advocated the midshipman, having passed through the intermediate training stages, becomes a sub-lieutenant without further examination; but it is in order that his qualification for the more important grade of lieutenant may not be assumed without further test. I think, also, there should be a minimum of two years' service in the lower grade before the rank of lieutenant is obtained. During this period he should, as now, go through various courses, chiefly of a practical nature, and be examined by a Board of officers as to his qualifications for lieutenant. His time at Greenwich in no case need

exceed three months, and should be devoted to special subjects which are now almost neglected by the majority of this grade who attend the course.

It is very desirable that, instead of as now, sub-lieutenants spending a large proportion of their time under instruction, they should be at sea, and this seems quite feasible under the method of entry and training I have suggested.

It will be observed that qualification for the rank of sub-lieutenant is practically obtained during the sea-going training course, though the grade is not conferred until after the midshipman has served in the fleet and demonstrated by conduct and efficiency his fitness for the office. This seems to me sufficient in view that the more important step of becoming a lieutenant has a further test, and one in which the practical duties of this rank are made the subject of enquiry, in addition to a mere knowledge of study and drill. It might be said, Why not let the midshipman graduate from his training course with the rank of acting sub-lieutenant, to be confirmed after a certain service in the fleet? But I prefer the arrangement which requires him to commence his regular duties as a midshipman.

Summing up then the recommendations so far, they are :—

Entry to be by open competition, with age limits from fifteen to seventeen.

A period of eighteen months in a naval training establishment.

A further nine months in a sea-going training squadron.

Qualification for rank of sub-lieutenant on completion of training.

Promotion to this grade in sea-going ships, according to result of graduation and merit as an officer.

Qualification for rank of lieutenant to be obtained by advanced course of professional subjects and practical demonstration of fitness.

Special Branches.

By what is considered by the writer an improved method of training, we shall obtain lieutenants with a good general knowledge of all subjects connected with their profession. The progress of naval science requires that a certain number of officers should go further in the study of special branches. In the methods now pursued to attain this, little change seems necessary. The art of navigation is not a difficult one, but was in the past somewhat neglected by the general mass of officers, for reasons upon which it is unnecessary to dwell. When a special corps—to which this essential part of a naval officer's duties was confided, and the members of which did not ordinarily rise to the command of ships—was abolished, and the duty performed by lieutenants, we adopted the course pursued by every other Navy. It has been attended with admirable results, and no one could wish to see the old system revived. As evidence of how much depends on early training, I know one foreign Navy at least in which the captain selects any of his lieutenants he pleases for navigating duties, which shows a special corps is not absolutely necessary.

We are now reaping the benefit of our change, for lieutenants who took up navigating duties are now in command of ships, and no doubt find the benefit of their former experience.

Gunnery and Torpedo.

The modifications which have assimilated, as far as possible, the theoretical courses for these two branches leave little to be desired in their efficiency. They form a body of highly-talented officers, but I think the standard in theory has been attained only by immense efforts and perseverance. Many have felt keenly in the advanced course prescribed the drawback of defects in early education. In the United States we see naval officers eagerly sought for in those great commercial businesses which have so marvellously produced ship's ordnance and armour in so short a time. The scientific knowledge of the naval officer there has been acquired in his graduate course. That of our own officers has been acquired later by self-tuition. But I cannot help thinking that the Navy would never have allowed the construction and supply of their ordnance to remain in the hands of another Service, if it had not laboured under the defects to which I have alluded. These will, it is hoped, disappear, and none would benefit more than gunnery and torpedo-lieutenants.

Marine Corps.

I bring this corps, so long connected with the Navy, in here, because of my desire to make its officers of as much value to the Navy as the men. Far from wishing to abolish this Force, I desire to see the tie between the two Services made closer. How can this be done? Marine officers complain, and with justice, that after an elaborate training they are embarked, and then find little scope for their zeal and knowledge in the duties allotted to them. There is, moreover, slight prospect in the future as regards high positions after long service. They wish to belong completely to the Navy, but in ships are given little authority or responsibility. The reason for this is that their training is not naval; and the only way, it seems to me, to make the services of these officers really valuable to the Navy is to modify greatly their early career. To this end, I would suggest that officers for the Marine corps be recruited in the same way as naval cadets, to enter at the same age and under similar conditions, undergo the same training, and not branch off to the special line of Marines until their naval training is complete. Then when the naval sub-lieutenant goes to Greenwich the Marine candidate would also go there, and study certain special subjects, eventually going into barracks for company and battalion drill. In the French naval organisation there is a school of musketry at Lorient, in which officers qualify as "fusilier" lieutenant. The course is five months, and on completion these lieutenants are appointed to large ships for what we may call small-arm duties. These are in connection with the special "mousquetaire" branch for seamen who qualify at Lorient as "fusiliers"—independent of gunnery and torpedo—and form the landing companies on board ship.

My idea is that our Marines should be analogous to this corps, and

the officers take similar duties[1]. Their naval training would also enable them to be utilised for other work on board. Instructed in navigation, and having taken part in the general routine of a ship, they would be qualified to take charge of a watch. Their uniform should be adapted to the distinctly naval functions they would assume. It is now purely military—an innovation which is comparatively modern.

There can be no question that under the foregoing conditions blue should be the universal colour for naval service, in all naval branches, and stripes on sleeves indicate grade, in place of elaborate braid ornamentation. This could be effected without altogether obliterating the special characteristics of a Marine corps.

There is another aspect of this question in which a close approximation of Marine to Naval officers may commend itself at a time when the list of the latter, as regards lieutenants, barely provides sufficient of these officers for ordinary requirements. It is that with the changes advocated we should possess practically additional executive officers, and in each ship supplement the lieutenants by one able to assume functions of which, hitherto, he has only been a spectator.

It is impossible within the limits of this essay, dealing with so many important subjects, to present such a change in more than outline. It is important enough, however, to be referred to a joint committee of Naval and Marine officers, who, accepting the great principle of cementing and drawing closer the connection between two bodies which long service in the British Navy has linked together, shall find the means of making still more useful that corps which has even been proud of the connection.

In making these suggestions, I wish it to be clearly understood that I do not seek to destroy the individuality of the Force as Marines. Their traditions are too marked, and their services so much appreciated, that few would desire to see these obliterated by simple absorption into the Navy. They themselves would not welcome any such radical change. But if the higher grades are retained as now there must be more to look forward to than at present, and these should be found in home ports as well as stations abroad. There are many important commands in places dependent on the Navy which might well be filled by colonels and generals of Marines. It can hardly be said that the Navy has its fair share of positions of responsibility in outlying parts of the Empire. The fitness of the Marine officer, with his dual training and knowledge of fleets, for such positions can hardly be questioned. Practical recognition of this in the future, with adoption of my suggestions for the earlier portion of his career, would remove all discontent, in addition to proving beneficial to the State.

Engineers.

In 1838, regulations were promulgated by the Admiralty for the appointments, rank, pay, etc., of engineers for the Fleet. They were

[1] The naval gunnery lieutenant should give up these duties, and devote himself chiefly to his guns of all calibres. These are a sailor's weapons, and it is foolish to try and make bluejackets proficient in elaborate brigade movements.

appointed by warrant, to be distributed into three classes, and to rank next below carpenters on the list. It is unnecessary to deal with the qualifications demanded, but they were of a simple nature, and sufficed in those days to provide us with an efficient and practical body of men. In Marine engineering, such as it was then, England was well to the front, and I have heard it stated that in the early French steam war-ships many English engineers were serving.

Many changes in the status of naval engineers have taken place since then; but throughout we have adhered to the principle of having a separate branch for these duties. I have alluded earlier to the reluctance with which officers at that time admitted the importance of steam-power. This influenced the position of those whom we were obliged to enter for charge of machinery. It has continued to some extent to this day. For a long time engineers were a body apart, but the gap is now narrow, and every year sees it reduced by some step which removes what engineers have perhaps felt as their isolation in the Fleet. They now enter the Navy when from fourteen to seventeen years of age by competition, and those successful become engineer students. They then join the instructional depôt at Devonport, and go through a five years' course in the dockyard. They then qualify as probationary assistant engineers, in which grade they are confirmed if satisfactory at the end of a year, and eventually go to sea as assistant engineers.

The course of training is very thorough and practical, with the result that we have in our engineers a well-educated and efficient body of officers for the important duties which devolve on them. It will be observed, however, that they are not brought in contact with the younger officers of the Fleet until they meet in a sea-going ship. I cannot help thinking that it would bring this branch more in harmony with the others if it were recruited much in the same way, and entered the Service through the same channel. Let all join the training establishment, and on completion of the eighteen months—or even a year—those who intended to follow the career of an engineer could undergo the further training in a dockyard, as now, instead of embarking in a training squadron. If fifteen to seventeen is the age adopted for entering cadets, it is not dissimilar to that now prescribed for engineer students. Friendships would be formed in the training establishment, to be renewed afterwards at sea, which would tend to an increased sympathy between the branches, and conduce to that co-operation between them so essential to the best interests of the Service.

Paymasters.

I must confess I do not see any particular advantage in delegating the clerical duties on board ship to executive officers, as is often suggested. At present they are non-combatant, it is true, but not everyone in a naval action can be wielding a weapon. There is plenty of work in other ways for the small clerical staff employed afloat. It does not require an expert swordsman to assist in removing the wounded, or to be of help to the surgical staff. A large number of men must be detailed for labour below the fighting deck, where skill in arms is not required.

Lieutenants and sub-lieutenants can be ill-spared for general supervision below. The clerical staff will be useful here.

There is another point of view which makes me prefer keeping matters as they are. The clerical line enables boys to join a profession in which their parents may have served, but who are unable to afford the expense of placing him in other branches. As a naval clerk his pay is better, and he is less dependent on home. I think this advantage should be retained. It is sometimes urged that the secretary to a flag officer should be an executive officer, as in some foreign Navies. I do not think the special work devolving on a secretary would be better done under such an arrangement. A commander-in-chief cannot delegate the drafting of important despatches to another, but in matters of routine putting his views in writing will probably be best carried out by one accustomed to clerical work.

Another idea is that the office of paymaster could advantageously be held by lieutenants, who, debarred from promotion, would thus have another outlet for his energies. I think this officer could, however, be more profitably employed in the Reserves and dockyards. The craze for having everyone in such an immense Service as the Navy moulded from the same pattern may, in my opinion, be carried too far; but I do think some advantage would be derived if candidates for clerkships were recruited in a similar way to cadets. They could, moreover, go through the training establishment, and there be given an insight into the duties they will afterwards undertake in the fleet.

Surgeons and Chaplains.

No alterations seem necessary in the regulations under which these branches serve in the Navy.

Distribution and Supply.

In a profession like the Navy it is very desirable that its officers should not only have continuous experience afloat, but should always be in touch with the progress made in every portion. To let an officer remain ashore nowadays for three and four years, away, perhaps, from everything connected with the sea, seems the height of improvidence. Nelson's case is sometimes quoted in proof of the opposite contention. His hand had not lost its cunning after a seven years' stay on shore. It is often forgotten, however, that in seven or seventeen years at that time ships and their weapons remained unaltered. A like period now sees some change in every portion of a war-ship's equipment. To be thoroughly efficient, an officer must be up to date in the feverish activity of naval armaments.

It is true, that at the present time there is little half-pay for lieutenants, but when the list is sensibly increased their services will not be in such request. That there should be a half-pay list at all has long pressed hardly on naval officers; for it is felt that when not afloat or on leave, he should be employed on shore duty or going through some course of instruction. Each officer might be attached to one of the home ports,

and belong for the time being to a ship in the Reserve. To carry this out barracks are required, and these are in existence or projected. Crews are allotted to ships of the Reserve for an emergency. Why should not this be completed as regards the officers? They would be enabled to gain some knowledge of the vessel they might at any moment have to join. Half-pay was instituted as a retaining fee: but it is a misnomer, as the amount is considerably less than this proportion, and not a living wage to a young officer without private means or a home to shelter him. It could be retained for all officers desiring to have long periods of leave, but for others a special rate of shore pay should be instituted in connection with the attachment to naval ports here suggested.

The supply of officers must be regulated by the demand, or rather number of ships maintained in commission, kept in Reserve and contemplated to equip on an emergency. The number of cadets the "Britannia" can take is limited. In an establishment on shore expansion can be provided for in construction, and in advocating such I had in view a considerable increase over present numbers, as well as accommodation for the other branches that I wish to see pass through the establishment.

Reserve of Officers.

There is no more difficult matter than the formation of a Reserve of officers, adequate in number and efficient in quality. It is doubtful whether any nation possesses this essential. Yet under the stress of war, we have seen the active lists rise in 1813 to 200 admirals, 800 captains, 600 commanders, and 3,200 lieutenants. How were they obtained? Probably, among other ways, by entering and sending straight to sea a great number of midshipmen. Promotion was rapid. The rank of captain frequently came at the age of twenty and twenty-one. We are now taking further steps to obtain from the mercantile marine a Reserve of officers for service with the State in time of war. I think this will hardly suffice, but that we should also look to the Navy itself to give an expansion of the lists. An admirable opportunity was lost when, twenty-five years ago, a number of young officers were allowed to retire because the lists were considered too redundant. No equivalent for this privilege was demanded, such as putting them on a Reserve list, and requiring them to maintain some connection with the Service.

A lieutenant of my acquaintance, whom private circumstances necessitated, much against his will, giving up his active career with the Navy at that time, sought to find some way by which his connection with the Service might not be entirely severed. He would gladly have joined a Reserve of naval officers, and carried out any occasional prescribed course with his old shipmates. But nothing then existed of that nature for retired officers. They were kept on the Navy List, it is true, but many commuted their pensions and disappeared, while the remainder gradually lost all touch with the Service. My friend desiring to give some effort towards national defence joined the Yeomanry, of which he is now a distinguished ornament.

But vain regrets are fruitless. Of late years an effort has been made to secure the services of some of these officers with success. More is required, and as soon as the lists are a little fuller we should add to our Reserve by allowing lieutenants of a certain standing to retire, under conditions as to recall in time of war, and periodical training to keep up their professional knowledge. We could also supplement the number who go into the Coastguard, by giving certain appointments in the ports and dockyards to lieutenants who, seeing they would not be promoted, or having no special aptitude for service afloat, would gladly continue serving beyond the age laid down for retirement.

Some such system is followed in the French Navy. There is a separate list of lieutenants *en résidence fixe*, which was created specially for harbour service. These officers give up all claim to promotion and are allowed to continue serving until sixty years of age. There are twenty-one lieutenants so employed.

In addition to these, France has instituted a Reserve of officers, which is of comparatively recent date. It comprises all below flag rank. That list is provided for by all admirals having an intermediate stage before being retired, and forming a second section (Reserve) of the flag list. The Reserve of other officers is formed of officers who are allowed to leave the active list for service in the mercantile marine, in the colonies, or in commercial enterprises connected with the Navy. These officers can be recalled to the Navy if required, but give up at the time all claim to promotion. They are allotted to the different naval ports, which they join in case of a general mobilisation. By the Navy List for 1894, there were twenty-one captains, sixty-one commanders, and eighty lieutenants in this Reserve. It is even extended to sub-lieutenants, for there are forty of these officers also in the list of Reserve.

From this one may suppose that in France the scarcity of lieutenants we experience does not exist. And this can be realised when we observe that in 1894 the active list of lieutenants was 717, and of sub-lieutenants 512 ; while we with a much larger fleet had only 844 lieutenants and 210 sub-lieutenants, or an aggregate of both only slightly greater.

For this reason we have this year been obliged to increase the list of lieutenants by placing on it a considerable number of officers from the mercantile marine. As a temporary measure and one of necessity I do not share the objections which have been raised to this course. It must be remembered, however, that to these officers we looked for the principal Reserve to the lower grades in time of war. The fact must be patent that if we absorb now the best of these men we weaken both in quality and quantity what will remain to us for a real emergency. As soon as the lists will permit we should form our Reserve from officers who have served in the fleet. Many who find the Service irksome in time of peace, who have an inclination for other pursuits, would willingly serve against an enemy. There is not much benefit to the State in the retention of unwilling and half-hearted service. Not a few who having entered young, more perhaps at their parents' wish than their own, would like to leave if the regulations permitted. They may afterwards regret it, but their early training and

experience would be of value both to themselves and the country. The number entered should be such as to allow for a considerable overflow in this way. From it our Reserve could be augmented. The expansion of the lists of the higher grades in war must be effected by promotion from the lower; whereby we secure the most recent professional knowledge and experience, combined with the nerve and physical advantages of youth.

It is to complete and strengthen numerically these grades, upon which there would be such demands as indicated, and in additional ships commissioned, that we mainly require a Reserve of officers. They must not all be past the prime of life, and hence we should strive for a condition of the lists which will enable certain officers after being trained by the State to pass into the Reserve. They would be subject to recall to active service when required, and would periodically renew their connection with the fleet. Many would gladly embark for the annual manœuvres.

By the various suggestions here put forward we should, I believe, ensure the country having an efficient body of officers equal to any demand.

SEAMEN.

Past Methods of Manning.

It may still be said that no satisfactory solution has yet been found of that difficult problem which involves the maintenance, constantly and during peace, of a large body of men suitable for manning the Navy—while having at the same time available Reserves to be brought rapidly into action upon an emergency. In all the old wars, we completed the manning of our ships by impressment, and when this procedure was abandoned nothing was substituted until the continuous-service system came into operation after 1852.

There can be no question that impressment afforded us a rapid way of obtaining men, and its justification was found in the defence it afforded to the country. Seamen themselves saw the difficulty of equipping our squadrons, and getting them to sea without this power. If it might be considered that this abuse of liberty formed any cause of the mutinies which disfigured our naval history at the close of the last century, the fact remains that other grievances were made most prominent. In the demands of the mutineers on the Admiralty hardly a word is said about impressment, and it was continued without interruption up to the close of the war in 1815. For two or three years previously the number of men impressed into the Service had been about 10,000 annually. Officers of the greatest experience could not contemplate the abolition of this custom without alarm. In 1852, Admiral of the Fleet Sir Byam Martin said: "My decided opinion is, that it is not within the compass of human contrivance to light upon any scheme equivalent to impressment as a means of bringing the seamen together with the rapidity which a general armament must ever require. If we part with that means of sending forth our fleets with the alacrity, and in the overwhelming strength which so astonished and con-

founded the nations against which we armed in 1787, 1790 and 1791, England will no longer be what England was on those occasions; and we shall have the mortification to see the French, for the first time, beforehand with us by means of their maritime conscription, which is in fact impressment under a somewhat milder name."

The opinion of Mr. Marsden, who was Secretary to the Admiralty during the old war, is also interesting. He said: "Upon the whole, I am clearly of opinion that when the country shall be suddenly forced into a state of hostility, and we are called to exert the national energies, the fleet cannot be manned without impressment; and that, notwithstanding any sums which may be lavished upon plausible schemes of enrolment (that is, of securing the services of men when wanted by a retaining fee), no minister possessing the nerve that his situation demands will, under such urgent circumstances, shrink from the responsibility of acting with a vigour beyond the experimental law by adopting the only prompt and effective mode of procuring seamen, instead of waiting for the tedious operation of calling together unwilling pensioners, while the enemy having the start in equipment are actively employed in destroying our commerce."

What chiefly impressed those who were responsible for the operations of our fleet in those days was the advantage of rapidity in manning. When we gave up the practice of impressment, and provided no substitute, the effect was lamentable. Ships were detained often for weeks and sometimes for months after commissioning for lack of men. This continued up to the Crimean War. The custom, hitherto, had been that, when a ship paid off, the Marines went to barracks, the boys to the flag-ship, but the seamen were paid off *in toto*. In 1852, on the recommendation of the Manning Committee, a more permanent form was given to our corps of seamen by the introduction of the continuous-service system, by which men engaged to serve for ten years. This was in operation and working satisfactorily during the Crimean War, but at its termination reductions were made, and many of these men were allowed to leave without purchasing their discharge, which otherwise was a condition of the system.

Although, therefore, we had solved the question of a trained permanent force, it did not provide a Reserve sufficient for our requirements, so that after this war a Royal Commission on Manning was appointed to inquire into the best means of manning the Navy during peace, or in case of sudden emergency or war. This Commission was composed of the Earl of Hardwicke, the Marquess of Chandos, Mr. Edward Cardwell, Vice-Admiral W. F. Martin, Sir James Elphinstone, Captain John Shepherd, R.N., Mr. W. S. Lindsay, and Mr. R. Green. They commenced their inquiry in June, 1858, and submitted their report in February, 1859. It was unanimous, except in the case of Mr. W. S. Lindsay, who did not concur, and put forward a separate memorandum. The Commission considered that the continuous-service system had been attended with very beneficial results, and that by it the ordinary peace establishment of the Navy could be maintained at whatever constant force Parliament might determine.

The Committee of 1852 had stated that it was to the entry of boys they must look for the gradual organisation of a permanent Navy. Experience had taught them that "men who had been received into the Navy as boys become from early habits and associations more attached and adhere more closely to the Service than those entered at a more advanced age, and that they eventually constitute, from their superior education and training, the most valuable part of the crews of Her Majesty's ships." The Commission of 1859 concurred in this, and recommended additional training-ships, so that all the boys required for the Navy should receive the same instruction. This has been carried out and further developed, so that the training of boys and their continuous service afterwards in the Navy for a certain period form the main points of our system to-day for manning the fleet. The Commission then considered the means of manning the Navy in case of emergency; that is, providing crews for additional ships and making good the waste of war. At that time if voluntary enlistment failed, the law provided it could be supplemented by:—1. An embargo prohibiting merchant vessels from going to sea. 2. A bounty inviting seamen to enter the Navy. 3. A proclamation compulsorily requiring the service of seafaring men according to classes. The Commission point out that impressment should no longer be resorted to. Independent of abstract questions of justice and expediency, the changes in naval warfare had rendered it absolutely necessary that our vessels should in any future war be manned, not by a promiscuous collection of untrained men such as impressment formerly provided, but by seamen who are practised gunners. In considering how these could be obtained, the French system, by which every seafaring man has to serve on board a man-of-war for a fixed term, was put aside as inapplicable to this country. The suggestion of a ballot for the Navy as for the Militia was also not considered feasible.

Taking the Reserves as they stood then, viz., the Marines on shore, the Coastguard, the Naval Coast Volunteers, and short-service pensioners, it was recommended to increase the Marines by 5,000 men, who should garrison the sea ports in time of peace, and when required to embark their places should be taken by the Regular Army or the Militia. It was pointed out—and this is often lost sight of now when people propose to largely increase this Force—that there is a limit beyond which it cannot be conveniently increased, for it is necessary to the efficiency of Marines that they should spend a large portion of their time afloat. The greatest number of Marines that has been borne at any time is 34,000. That was in 1808 when there were 98,000 seamen. The greatest total number of all branches borne for Naval Service was 147,000 in 1813, when the number of Marines was 31,000. At the present time, out of a total borne of 88,000, there are 15,000 Marines. In view of the greater number of ships we are now gradually employing, and additional seamen voted, the Marines will probably be increased in the next few years to 18,000 or 20,000. A Reserve of this Force should be created for providing additional trained Marines on an emergency. The Commission recommended the Coastguard to be increased to 12,000. A considerable increasd was contem-

plated when the Force was transferred from the Customs to the Admiralty in 1856, but for some reason or other this has never been carried out. At the present time it consists of 4,000 officers and men. Yet this is the most valuable Naval Reserve we possess, consisting of men, most of them in the prime of life, who have served at least eight years in the Navy. They form a connecting link between the Navy and the civil population in places where a ship-of-war is never seen. They represent a Force which we wish identified with the nation—not regarded as an isolated body. In small seaports the Coastguard take a lead in aquatic sports. They form attractive centres of recruiting to the lads of the village. Though not a portion of their duty, they often complete the crews of the local lifeboat. In time of war they, in addition to going afloat, have to work the signal stations now organised all round the coast which pass information from one part to another, and to headquarters, that a friendly or a hostile ship is in the vicinity. No other body of men can do this so effectually. Well acquainted with our own ships, the appearance of a stranger is at once detected by the Coastguardsman. No merchant seaman or landsman would be of value here, and hence to denude the signal stations to any great extent of Coastguardsmen to help to man the fleet would be a mistake. An addition to the Force would enable it to efficiently fulfil both duties. Houses have to be provided for these men, and the expense no doubt has kept the number down; but this should not be allowed to stand in the way of augmenting one of the most valuable branches of our naval organisation.

But the Commission considered that besides the Reserves we ought to be able to add to them by a further Force of from 20,000 to 30,000 seamen *well trained in gunnery*, who could be relied on to come forward when required. This Force it was proposed to obtain from the mercantile marine, and the suggestion being adopted is our present Royal Naval Reserve. There was at the time a body of men enrolled under special conditions called the Naval Coast Volunteers. They were chiefly composed of boatmen and fishermen, hence were not seamen in the then acceptation of the term, that is, capable of going aloft and handling sails. Moreover, their service was limited to one hundred leagues from the shore, so they were not regarded as of great value.

PRESENT STANDING FORCE.

Entry of Boys.

In accordance with the recommendations of the Manning Committee of 1852 and the Royal Commission of 1859, we now mainly rely, for a permanent Force of seamen, upon the entry and training of boys. They must be of sound constitution, able to read and write, and be between the ages of fifteen and sixteen-and-a-half years. There is a standard of chest and height measurement. No boys are received from reformatories or prisons. Each boy desiring to enter, must bring a written consent from his parents or relatives to his joining, and engaging to serve until he shall have completed twelve years' continuous service from the age of eighteen.

Training-ships are established at different ports, where their education is continued, and instruction given in professional subjects appertaining to a sea-life. This is further extended by a course of training in sailing-brigs. In about two years from entry they are sent to sea-going ships as first-class boys, and at the age of eighteen are rated ordinary seamen.

This system leaves little to be desired. The lad is brought under discipline at an early age, and imbibes the spirit of obedience and respect to his superiors, which remains with him in his after career. Trained by, and associated with, the officers of his profession — who are carefully selected—there is thus formed a knowledge of, and interest in, each other from the beginning, which is continued in sea-going ships. In the hour of danger, in the presence of the enemy, there is a comradeship, never separated from discipline, which enables the naval officer to place great reliance on his men, and they on him. It is this characteristic, created by continuous connection, that leads to the efficient performance of duty under the most trying circumstances. Discipline of as high an order is maintained in our ships all over the world as in home waters; whereas with some foreign Navies I have observed that in distant parts there is a relaxation of discipline, in compensation perhaps for the inevitable discomfort attaching to such service.

No difficulty is experienced in obtaining the number of boys required, as may be evidenced by the increase made to the number of seamen employed during the last ten years. Independent of an instinctive liking for the sea in the young of this country, the advantages offered by a naval career are now such as to ensure the entry of an ample supply.

One excellent source, in addition to being a means of rewarding good service among the naval forces, is that afforded by Greenwich School. Here are fed, clothed, and educated, free of all cost to their parents, the sons of seamen and Marines who have served well for a certain period. The only condition, as in the case of other boys, is that they engage to join the Navy, and bring a written consent from home to serve for twelve years. They are taken at the age of eleven and retained until fifteen-and-a-half, when they are passed on to the training-ships. They are given an excellent education at this school, and with the most advanced even the study of navigation is undertaken. Not a few use the sextant with skill and take sights. This is with a view to eventually becoming warrant officers and qualifying in navigation. The rudiments of seamanship are also instilled into them, for which purpose there is a rigged ship in the grounds where the boys are taught to go aloft and exercise with the sails.

They thus go to the training-ships with a good grounding in all respects, and accustomed to discipline which is essentially naval at Greenwich School.

A thousand boys are allowed by regulation at this establishment, and there are 100 day scholars in addition. So numerous are the applications to join, that a selection has always to be made, and between 200 and 300 are passed annually into the Navy on becoming fifteen-and-a-half years old. A high standard of physique is required, and any not suited for the

Navy in this respect are debarred from joining. Few are aware what excellent service Greenwich School performs to the State.

No difficulty then is experienced in obtaining any increase of boys authorised by the Estimates. Thus in 1886 provision was made for training 2,600 boys, while this year the number is 4,600. This has necessitated increased accommodation. A training-ship for boys has been established at Edinburgh, and it is contemplated to place one at Queenstown in Ireland.

In addition to these resources, we have instituted a cruising, recruiting, and training-ship in the "Northampton." She goes round the coast and enters boys of a somewhat later age — between sixteen-and-three quarters and eighteen years—training them for ordinary seamen. This method has not been long enough in force to estimate its value.

Training of Seamen.

The rating of ordinary seaman does not conclude the period of training. This is only practically attained when a man becomes an able-seaman. He is then supposed to be a skilled craftsman in the trade of the sea. To qualify for this a further knowledge of seamanship and gunnery is demanded, acquired by experience and instruction. For this purpose the training squadron was mainly instituted, because modern ironclads and cruisers, being without masts and yards, cannot give that species of training which is considered desirable in the earlier portion of a seaman's career. It is not the ability to work a ship under sail which is sought by thus retaining what is practically obsolete. It is the imparting and developing of those physical qualities, that readiness of resource, that keenness of nerve which movement aloft and its accompanying exercises alone produce. This training corresponds to that on shore of the hardy mountaineer, whose frame, eye, and nerve, are developed by the particular life led. The mastery of the wind in its uncertainty inculcates watchfulness and ever-present readiness to meet its vagaries. This form of seamanship is not the end, but the means to an end; and its most valuable result, as far as a modern Navy is concerned, can be attained without unduly prolonging it. There is so much else to be learnt that only a limited amount of time can be given to mast exercise. But if this should continue—as I believe it should—an essential part of a seaman's training, it should be general, not partial. Every ordinary seaman should undergo it, but at present only a portion can pass through the training squadron. On the Mediterranean, it is true, there is a sailing-ship—the "Cruiser"—for training ordinary seamen, but not, I think, on any other. The consequence is that a number of men of this rating go to ironclads without undergoing this useful part of their training, and have to be instructed there in such elementary subjects as heaving the lead and steering by compass.

To carry out the principle thoroughly either the training squadron should be increased, or ships with masts and yards specially added to each station for the training of ordinary seamen. Both steps are probably

necessary to ensure all our young seamen supplementing in this way their training as boys in seamanship.

Gunnery.

The training in gunnery our seamen now receive is on the whole thorough and effective. The knowledge of the ordinary seaman in this respect is much advanced by his being allowed to qualify for trained man, while to become an able-seaman a considerable proficiency in gunnery is required. I think, however, the instruction in weapons now given to an ordinary seaman should be with a view to his qualifying for the higher rate, and that the efficiency which such a term as trained man seems to imply can hardly be associated with a seaman who is only an ordinary. An able-seaman is considered trained by his nomenclature, but the addition of trained man might follow, as indicating an advance of knowledge and a preliminary to his becoming a seaman gunner. It could, moreover, be reserved for those who, failing to come up to the high standard required for the qualification of seaman gunner, yet had acquired a respectable knowledge of weapons used in the Navy.

Among these weapons the torpedo has now a recognised position, and therefore, as gunnery includes big and small guns, rifles, pistols, and swords, the torpedo should be added to the list. A seaman gunner should be a torpedoman as well as a swordsman; but when it is desirable to give advanced instruction in this particular weapon to a certain number of men, the torpedoman becomes a specialist. There are certain duties which he alone is qualified to fill, and for the training of others the services of such teachers are required. In certain elementary portions of torpedo work every seaman should be instructed. If only a select few have any knowledge of this weapon, they may be all disabled in an action, and thus perhaps cripple, or lead to the inefficient working of, an important element in the offensive power of the ship. For the advanced grades, both of the gunnery and torpedo service, I do not think any great improvements can be made to the arrangements now in force. In the harbour training and the exercises at sea good practical work is done; target practice has been assimilated more and more to actual warfare, while all concerned take an interest in its efficient performance, sadly wanting some years ago.

Number of Seamen and Boys Afloat.

In 1886 there were employed in the fleet approximately 37,000 seamen and boys. In 1895 provision is made for 57,000. Thus, though our want of men is continually stated, it cannot be said that we have not taken steps to provide for manning the increased number of ships we now employ. These numbers include engine-room complements, which form a considerable proportion.

Marines.

In the Royal Marines we have a most valuable auxiliary to the seamen proper. At times the question of their abolition has been mooted, but the general feeling, both in the Navy and the country, has been strongly against such a step. On the contrary, steady increases have of

late years been made to the Force. In 1886 the rank and file of the artillery and infantry numbered 11,150. For 1895 it is 13,500. The First Lord of the Admiralty, in his memorandum on this year's Naval Estimates, says :—"During the past financial year 1,870 recruits have been raised for this corps, bringing the numbers up to within fifty of the increased establishment for which provision was voted. Notwithstanding these large entries, the class of recruit has been quite up to the average; the height qualifying for admission has been maintained at an average of 5 feet 6 inches. The recruits for the Royal Marine Artillery are well above the average, present entries being men of 5 feet 9 inches."

This is very satisfactory, proving that there is no difficulty in recruiting men for this popular Service. With some slight relaxation of the conditions, we can obtain as many as we require. Of course, the total number recruited must be based upon the facilities we possess for giving them that training at sea which, superimposed upon that given on shore in barracks, makes the Marine so valuable. When that limit is passed we must either have a large number on shore getting no experience afloat—in which case they become line soldiers—or we must increase the complement of Marines in ships and displace so many seamen. Neither of these alternatives is desirable, and hence we cannot add very considerably to the number of Marines. The total, including officers, proposed for this financial year is 15,300. In view of the additional ships now under construction, and those which will no doubt be commenced in the next few years, I think this number might be gradually increased to 20,000.

There is one change, however, which might well engage the attention of our naval authorities, and that is, whether the time has not come when we might once more revert to a single corps of Royal Marines. Sixty years ago there were one hundred and two companies of Marine Infantry and twelve companies of Artillery. The institution of the latter was due to some extent to the insufficient training in gunnery of the majority of our seamen. Since the establishment of the "Excellent" in the thirties this reproach has passed away. There are inconveniences in having two corps of Marines with different uniform and drill. It is an anomaly which should be removed. Let there be one corps of Royal Marines, the colour of whose dress should be blue, and whose training in ship's weapons should be similar to that of the seamen. The traditions of the corps would remain, and its efficiency would not diminish. Their training is now excellent, but the change suggested would fit in with what I have proposed for the officers. The Marines, while being generally instructed in gunnery, would have a special training in company and battalion drill providing as now the nucleus of the landing party in individual ships, and composing, when landed from a squadron, an effective battalion or brigade for service on shore. There would thus be no departure from the duties which have always attached to this Force, and which at all times have been performed with an efficiency, the admiration for which is not confined to this country. In the reign of Louis Philippe a searching inquiry was made into the condition of the French Navy by a Parliamentary Commission, and its relative state as regards that of this

country. Many distinguished officers were examined, and their general opinion was that in *personnel* and *matériel* their Navy was quite equal to ours. But they said: "England has a Force which no other possesses. It is unique and of inestimable value to the Navy. It is the Marines." May it be long before we voluntarily deprive ourselves of this useful adjunct to the Navy!

ENGINE-ROOM STAFF.

There is no doubt that in any future war much will depend upon the skilful manipulation of the machinery. Good or bad stoking may affect the issue of an important operation or strategical movement. Are we sufficiently alive to this?

In the report of the Committee on the Naval Manœuvres of 1888 attention is called to the number of deck hands employed in the stokeholds of many of the ships engaged. It was pointed out that in the case of the "Warspite" breaking the blockade at 16 knots-speed thirty-six deck hands were sent to assist in the stokeholds, at a time when in real war every man would be required at his station for battle. Such a fact the Committee consider must be due "to a deficiency either in complement, the quality of the stoker, or to inexperience." They are inclined to attribute it to the last. In this report are the opinions of several captains of ships. One says: "Second-class stokers lack experience and physique, require constant help from deck." Another considers the number of second-class stokers should never exceed ten. The commander of the "Grasshopper" at that time reports: "All stokers carried in vessels of this type should be thoroughly trained."

For the duties of fireman or stoker we now enter young men direct, but they should go through a regular course of training before being drafted to sea-going ships. This should include stoking in torpedo-boats and destroyers, as well as larger vessels.

The aforementioned Committee suggested that, "As a means of affording opportunities for training newly-raised stokers, one year should be served by them as supernumerary in a sea-going ship before they are considered fit to be drafted as part complement to any vessel." The First Naval Lord on this suggestion remarked: "As to training the second-class stokers, this I prefer to leave to the captains of steam Reserve; and a proportion of these men are now employed in the Indian troop-ships as supernumeraries for training in addition to the complement." Since then, however, the use of these troop-ships, except one, has been discontinued, so a substitute is required to supplement the training of stokers. In Italy I think a special vessel is employed on this service, and it would be worth our while to do the same, or carry out the suggestion of the Committee, for it is experience at sea that is required. In bad weather there is much sea-sickness among young stokers for lack of this experience.

Owing to improvements made in the pay and prospects of this branch the class of stokers entered has improved, and no difficulty is found in getting the numbers required. He can rise to chief stoker, where the highest rate of pay is 5s. a day.

The next above this grade are the engine-room artificers, who alone join the Service as chief petty officer, and do not acquire it by service and merit. On the other hand, they have no warrant rank, and cannot rise to engineer officer. Both in position on entry, and in the limit of their progress, I think our regulations are faulty. The status of a chief petty officer should only be reached after experience in the Navy has proved the fitness of the recipient. The position and command over others it confers should not rest alone on mechanical or technical skill. This should be ensured by increased pay, or addition to wages. If engine-room artificers entered with a lower grade, the question of their advancement, and punishment when required, would not present the difficulties they do now.

For some years the engine-room artificers have been striving for warrant rank. To confer it would, I think, be a mistake. It is neither one thing nor the other, and would not greatly benefit their position. Such a step would increase the difficulty of providing cabin accommodation.

At the same time, it seems to me desirable there should be a further prospect than that of attaining chief petty officer's rank. Why should not these men rise under certain conditions to engineers? I have known an engine-room artificer who, in manipulation of the machinery, was equal to all the duties of chief engineer, while in education and bearing he was fully qualified for the position of an officer. Why should not such be permitted to rise from the ranks? A concession of this nature would stop—or could be used to stop—all clamour for warrant rank, and, probably, lead to even a higher class of artificers entering the Navy. This system is carried out in France, where engineer officers are principally recruited from the engine-room staff; that is, they pass through the intermediate grade of chief petty officer.

Total Number Borne for Peace Establishment.

To appreciate the increase that has been made to the peace establishment of the Navy during the last ten years it may be stated that, whereas the Estimates of 1886 provided for 51,500 seamen, boys, and Marines, not including boys under training, those for 1895 provide for a total of these classes of 72,000, or an increase of over 20,000 during this period. During the Crimean War the greatest number borne was 68,000 of these ranks.

There are no indications that we have arrived at finality in the strength of our permanent Force. It is calculated that we have sufficient men in the home ports to complete the complements of all ships ready for commission, and it is essential that these vessels, if required for an emergency, should not depend upon any Reserve which may not be immediately available. But we are adding annually ships to the fleet; that is, we are doing considerably more than replacing those which age renders ineffective, or which are considered obsolete. If our battle-ships are fewer and require less men to man them than the two and three-

deckers of old, we are providing more numerous and larger cruisers. This is in accordance with the increased demand for such vessels, owing to the growth of our commerce and the constructive policy of other nations. The regular cruisers we possess on going to war may have to be augmented by subsidised steamers of the mercantile marine, which must carry a certain number of seamen gunners in addition to Reserve men. Crews must be found for all torpedo-boats and destroyers; nor can such craft be worked by any but skilled men. I can foresee that we must continue to add to our standing Force, and consider that the numbers should be gradually brought up to 60,000 seamen, including stokers, 20,000 Marines, and 10,000 boys, of whom a certain proportion would be under training. This would give us an adequate peace establishment for the fleet, when it is brought to the strength required, and further construction is then directed to replacing obsolete vessels whose allotted crews would be transferred to the new ships.

Reserves.

In time of war we not only have to be in a position to equip additional ships for which crews must be found, but an expansion of *personnel* is necessary to fill up casualties. The waste of men during hostilities is considerable. For this purpose nations create a Reserve.

Ours for the Navy is derived from three sources: the Coastguard, Pensioners, and the Royal Naval Reserve. I have already alluded to the Coastguard, and, therefore, it is unnecessary to dwell again upon this body. Its existence is an inducement for boys to join the Service, and with a general increase in the number of seamen employed a proportional addition should be made to the Coastguard. Its strength is now 4,000. This total might be doubled, for all recognise the efficiency of these men, either for their signal duties on shore or when employed afloat.

Our Naval Pensioners may be dismissed with the remark that they are few in number, and practically valueless as a Reserve for active service. Long service and a Reserve from it are incompatible.

Royal Naval Reserve.

In the conclusion of their report, the Royal Commission on manning of 1859 said:—"Your Majesty possesses in the merchant service elements of naval power such as no other Government in the world enjoys. . . . . We, therefore, humbly and confidently submit to Your Majesty the adoption of measures which, while their primary object is the protection of this country from the hazards of war, must, at the same time, improve the character of British seamen in the two Services; and unite them together in the firm bonds of reciprocal good feeling, and of common interest."

These measures were adopted, and it remains to be seen how far the hopes have been realised.

Modifications have been made, from time to time, in the Royal Naval Reserve regulations, but they are now practically as follows.

This Reserve is divided into four classes :—

First Class.—Able-seamen of merchant service.

Second Class.—Ordinary seamen or fishermen.

Third Class.—Boys.

Fourth Class.—Firemen.

GENERAL CONDITIONS FOR ALL CLASSES.

Must be a British subject; good character; sound in body, and been at sea within four months of applying to join.

First Class.—Qualifications.

To be not above thirty years of age—with some exceptions—and have served six years at sea, of which two to have been as able-seaman. He must declare his intention to remain at sea for at least five years longer.

Training.

After being enrolled these men are trained to arms. This consists in undergoing every year twenty-eight days' drill in gunnery under naval supervision and direction. After the first year, these twenty-eight days may be divided into different periods of not less than one week's drill at a time. Men who show incapacity or unfitness in conduct are dismissed.

Remuneration.

While under drill to receive pay of able-seaman of the Royal Navy, and certain articles of uniform, during which time the Reserve man will be under naval discipline. Each man also receives a retainer of £6 per annum, paid quarterly. He can further qualify for trained man, and receive a penny a day extra while at drill.

General Conditions.

No restriction is put on employment in merchant service, provided the Reserve man reports himself to a registrar once in six months. To undertake a longer voyage than that, special leave has to be obtained.

Service in the Navy.

Men in the Naval Reserve can be called out by Royal Proclamation. This is only intended to be done on an emergency, and when a sudden increase in the Naval Force of the country is required. The Admiralty may decide also as to a calling out a portion of the Reserve. He is then liable to serve in the Navy for three years, and if at the expiration of that service war continues, his service may be prolonged for another two years.

On being called out Naval Reserve men apply to the nearest registrar or naval officer for instructions as to joining the Navy. If absent from the kingdom at the time, he is to join immediately on arrival. If serving in a merchant ship, abroad at the time, he may be called upon to serve by the captain of any of Her Majesty's ships.

Retirement and Pension.

A Naval Reserve man can claim his discharge at the end of five years or be re-enrolled. He can purchase his discharge if not required for the sum of £10. He will become entitled to a pension of £12 a year at sixty years of age, if joining under thirty he has been in the Reserve twenty years. If joining when above thirty the qualifying service is fifteen years.

Miscellaneous.

Reserve men who have qualified as trained man can volunteer for temporary service in the fleet during peace-time, or increase its strength. They are also eligible for the Coastguard to the extent of 5 per cent. of the annual vacancies in this Force.

Naval Reserve men in the United Kingdom and able to serve, who, when called out, fail to respond, can be arrested and treated as seamen who desert or improperly absent themselves.

Second Class.

This branch of the Reserve must be within nineteen and thirty years of age and followed for three years a seafaring life in ocean, coasting, or fishing vessels. The applicant must have some knowledge of seamanship and engage to follow his calling for five years. His gunnery training is the same as for the first class, and he receives during this period the pay of an ordinary seaman. The obligations for service are the same as the first class, but the retaining fee of second class is £3 5s. per annum, and there is no pension. A man may, however, be promoted from the second to the first class after two years in the former and qualifying as trained man.

Third Class.

These are boys from fifteen to sixteen-and-a-half years of age who have been a year-and-a-half in a mercantile marine training-ship, or similar institutions. They go through the prescribed drill and are paid and victualled during that period.

Fourth Class.

These are men between twenty-one and thirty-five years of age who with two years' sea service have served one year as firemen. They have twenty-one days' drill in gunnery and can become trained men.

During this period they receive 1s. 9d. a day pay, and 1s. 8d. a day subsistence. Their annual retainer is £6. They can continue in the Reserve up to the age of forty-five, and become entitled to a pension similar in amount and under same conditions as the first class. They are equally liable to be called upon to serve in the Navy on an emergency by proclamation.

How Obtained when Wanted.

It is the duty of every registrar of shipping to ascertain and keep the addresses of all Naval Reserve men to which notices can be sent. He is advised by the registrar-general of changes among the men of his district,

and has a knowledge of all particulars concerning their period of service, promotion, etc.

Efficiency of Royal Naval Reserve.

We have now to consider whether this force is efficient in quality, adequate in number, and can be relied on when their services are required.

As regards the first point it must be remembered that in 1859 the work of a man-of-war's man and a merchant seaman had much in common. Their ships were not dissimilar. Steam had made progress, but sails were used by both services. What constituted a prime seaman in those days was his activity aloft, not his knowledge of gunnery. Working of guns was a simple matter easily acquired by a sailor valuable in other respects. To heave on a handspike, or even ram home a charge, did not require elaborate instruction for its efficient performance. Hence the merchant seaman then was more than half-trained already. There was no indication of the great changes pending in war vessels and gunnery, which commenced in 1860. The merchant seaman now who goes on board a war vessel finds a structure which outwardly and inwardly is new to him in every respect. There is no assimilation to the liner, tramp, or sailing ship. His way about is found with difficulty. He is lucky if amongst the varied ordnance his eye lights upon the familiar piece with which his drill was performed in reserve ship or battery. The discipline which to officer and man in the Navy becomes a second nature by the association with it from boyhood, comes unwillingly to the man accustomed to the greater freedom of the merchant service. He does not see the necessity of absolute cleanliness. Unquestioning obedience and silence under rebuke are restraints not easily borne.

What a difference in France when the man who, having served his three or four years in the Navy, is called out! If his service has been fairly recent he at once settles down to the old routine, and has little difficulty in picking up the changes that have taken place since he disembarked. I do not think that under present conditions an efficient Reserve for any force can be formed unless it actually serves in that force for a fixed time. Supposing all the gamekeepers in the United Kingdom were given a retaining fee to undergo so many days' drill every year with the Lee-Metford rifle, and to join the Regular Army when called out—would they be considered an efficient Reserve for the Army? Yet these men have the physical attributes and are accustomed to arms. No! the only way to form a Reserve for the Army is to pass men through it as we have done under a shortened term of service.

The training of the Royal Naval Reserve has hitherto been very imperfect. Established round the coast of the United Kingdom are between forty-five and fifty stations where the drill is carried out. Some of these stations are ships; others are batteries erected on shore. In many the guns are of ancient type. This must to a great extent necessarily be the case where a fleet is in the process of re-armament and has the first demand on the new weapons. But the value of such a

training must be seriously diminished if the drill is performed with guns quite dissimilar to those the Reserve man would find afloat if called out. This absence of modern equipment at the training stations is not confined to the batteries on shore. Most of the drill-ships are equally obsolete. An effort is being made towards replacing them with modern cruisers, and this should be extended, but I cannot help thinking the work should be carried out by the district Coastguard ships having attached to them a coast-defence vessel or other suitable craft with modern guns for the purpose. Not so much time, moreover, should be devoted to rifle and cutlass drill, the big gun being the seaman's weapon.

Then as regards adequacy in numbers. It has been stated that at a certain period we had 147,000 men employed in the Navy. At that time our commerce was much less, our colonies fewer, and altogether our responsibilities as an Empire slight in comparison to what they are now. There were then only six fleets in the world of any importance. There are now more than double that number which have to be taken into consideration. A naval war with a single great Power would necessitate immense exertions on our part to afford protection to our various national interests. A combination would of course tax our resources to the fullest extent. We ought under either of these conditions to be in a position to man all the ships ready for commission, and have a Reserve to provide crews for those that would be brought forward as soon as possible. This Reserve should also afford the men for commissioning auxiliary cruisers and supplying the waste of war. How far have we gone towards securing these necessities of *personnel?*

The reply is not altogether unsatisfactory. If we consider what is now done annually in the partial mobilisation of the Fleet for naval manœuvres one cannot but be struck with the immense strides we have made in the ability to rapidly man additional ships when required. And if criticism is passed in one respect on this operation, in pointing to the previous preparation as regards the ships, made simple by the date being practically constant and well known, this does not affect the *personnel*, because the men are not specially collected in the ports for this evolution. Their numbers do not vary much throughout the year, and an order to-morrow to man additional ships on an emergency would be as promptly executed. Thus, last year, 1894, the crews of ships specially commissioned for the partial mobilisation amounted to 9,951 men. It speaks volumes for our improved organisation that we could at short notice commission additional ships of any class.

We have to consider, however, not what are the demands of a partial mobilisation, but how far we could meet the necessity for manning every available vessel. Lord Brassey, in the "Naval Annual," computes the complements of fifty-three battle-ships, 122 cruisers, and other vessels at 97,700. Only those in authority can say how far this corresponds to our actual requirements, but I am prepared to accept the round number of 100,000 men of all grades that we should want immediately on a great emergency. The number of seamen, Marines, and boys provided and available for 1895-96 are about 70,000. Allow that from Marines on shore,

Coastguard Service, and Pensioners, we could take 10,000 effective men, and it follows that our principal Reserve should afford 20,000 trained men within a week, and that this should not exhaust its resources because the waste of and demand for men in war would be continuous—our main Reserve should at least number 50,000 men. Can we under present conditions obtain them from the mercantile marine? At present the number of drilled men in the Royal Naval Reserve is about 23,000, of which a certain number are beyond the age of effective service, and we may put it that the Force consists of 20,000 able-bodied men. They are employed on the coasts of the United Kingdom, and on long and short voyages. How many would be available for the fleet at short notice? A committee on the Royal Naval Reserves a few years ago estimated the number at 10,000, "and that if efforts were at once made to recruit for the Navy, a considerable number in addition would be available within two months without unduly lowering the number of men held available for other purposes. There would, moreover, be a stream of men joining as they returned from abroad." The monthly returns showed that about 16,000 are either at home, or in near European waters, and on these returns the above estimate was based. Could, however, all these men, the pick of the mercantile marine, be taken from this service without great inconvenience?

It is evident that on the outbreak of a great naval war in which we were engaged all our sailing-ships and a great number of the slower steamers would discontinue their voyages. But it is not in these that the greater number of the first-class Reserve men are employed. They are mostly in the larger steamers, for which, owing to their speed, there would be increased demand. Would these men join the Navy with alacrity? This has never been put to the test, and opinions vary greatly as to the result of such a call. Are we wise to rely mainly upon such a source for a Reserve?

On the other hand, the second-class Reserve, being always on the coast, are available at any time. They have shown themselves equally apt at acquiring the prescribed drill, and hence this Force might be further developed. There seems to be no reason why these men should be on an inferior footing to the first class. The two classes originated at a time when a merchant seaman was relatively a better article for naval purposes. That no longer exists, and hence the time has arrived when the two classes should be merged in one. The term second class, which is not intended as a stigma, may deter many from joining—in face of the existence of a first class. If all joined as second class, and rose by merit and efficiency to the first class, the objection to the former term would also be removed. There are a vast number of seafaring men, yachtsmen, and others whom we have not yet succeeded in inducing to join the Reserve. It may be that the present distinction operates unfavourably in their minds. The remuneration of the second class is also insufficient in their view. Many naval officers who have had some experience with the Naval Reserve consider the time has come to re-organise the Force; and there is a general concensus of opinion that

one of the main points to engage attention is to make distinction between the good and indifferent, and place the second class on a better footing.

A Further Reserve for the Navy.

A complaint is continually made of British merchant seamen that they have deteriorated from former days. My opinion is rather that they have not advanced in civilisation so rapidly as other classes. It is unnecessary to seek the cause of this, but it has, combined with the abrogation of the Navigation Laws, caused the employment of a great number of foreigners in our mercantile marine. Owners find Scandinavians more sober and reliable. Asiatics for the Eastern traffic are efficient and less costly. The number of Lascars employed are very great. Consequently, the number of British seamen employed in this industry has not increased in proportion to the extent of our commerce or the growth of our population. It is doubtful if there are 50,000 able-seamen of British nationality in the whole of our merchant steam and sailing fleet. The repeal of the law which compelled ships to carry so many apprentices has also affected the number and quality of British seamen.

Surely this is a matter worthy the attention of the State. The commerce of this country constitutes its strength, and all connected with it should be fostered. Yet the one calling for which an apprenticeship is not considered necessary is that which supplies us with most of the necessaries of existence. Though State aid is given towards the teaching of many trades, little is done by the Government for technical training in this, the greatest and most important of all our national industries. Much might be done to remove this reproach from our great mercantile marine.

This could also be furthered in another way, and one which I think would not only improve the merchant service, but give a further Reserve to the Navy of drilled and disciplined men. The two Services should be linked together by a closer tie. One is dependent on the other. A national fleet is one identified with the whole seafaring population, not an exclusive Force unknown to a large proportion of the community.

Reserving the present system of continuous and long-service for the bulk of our Naval Force, from which we obtain our petty officers and experienced seamen, we should proceed to create a Reserve of trained seamen by allowing a certain number annually to leave the Navy after a shortened term of service. These would enter under an engagement to serve for, say, seven years, and then pass into the Reserve, in which position they would be liable to be recalled on an emergency by proclamation. This liability to cease at the age of fifty. The link between them and the Navy to be an annual retaining fee of fourpence a day contingent upon their undergoing a short period of exercise afloat or ashore every three years. During this time they would receive the pay of the rating with which they left the Service. Most of the regulations for the present Royal Naval Reserve could be applied to these men. I think, moreover, we could extend this principle by offering similar advantages to men who

now serve for twelve years and then take their discharge. They should join the Reserve. In this case the retaining fee should be increased to sixpence a day. A certain number now leave at the expiration of their first engagement and lose all connection with the Service, whereas it is desirable to retain a hold upon them in the manner stated.

As a corollary to such an arrangement, as well as to improve the *personnel* of the mercantile marine, additional boys' training-ships should be established at the commercial seaports, maintained locally with State aid. Boys trained in these establishments could enter either Navy or Merchant Service, but the majority would probably elect the former.

The essential idea pervading the foregoing scheme is that we should gradually accumulate a number of men still young who had served in the Navy, and distributed among various seafaring pursuits. It is presumed they would have no difficulty in finding employment in the Merchant Service. Steady and disciplined men should be welcome to shipowners, and their retainer added to pay would enable them to compete favourably with foreigners. I know a yacht owner whose crew is entirely composed of old men-of-war's men. They might be tempted to return to Service if war broke out by the offer of a large bounty, but not otherwise. How much better if these craft were manned principally by men with an obligation towards the State! They would be equally valuable to the owners.

Unlike many propositions connected with the national defences which usually require a large outlay of public money, this involves a comparatively moderate annual charge.

The expense may be viewed in two ways: that in which a contingent of men receive a reduced pension at an earlier age, and the amount be compared to that involved by the payment of a higher pension to the survivors of this contingent after twenty-two years' service.

Or, if a certain number are placed at once on a pension of 4d. or 6d. a day there must be an immediate addition to the Reserve vote. This addition can be calculated approximately for any given number annually passed into the Reserve, and it would continually increase until the required strength of the Force was reached.

At the age of fifty the Reserve man should be entitled to and receive a pension of £15 per annum; and he should no longer be liable for service in the fleet nor be required to carry out periodical exercises.

It will be observed that the fundamental principle upon which this scheme is based is that of requiring seamen, before being placed in Reserve, to give such a period of service afloat as should enable the State in return to grant, upon equitable principles, a corresponding pension for life, of an amount sufficient to make its retention or loss a matter of consideration, and, as a necessary result, a reasonable assurance that the men will be forthcoming when required.

As regards economy the practical result would be as follows:—

At present a man gives twenty-two years' service and then obtains a pension, on an average, say, of £20 per annum. Under proposed scheme

three men would give twenty-one years' service and receive £18 4s. a year. Instead of one worn-out man being placed on the pension list three efficient men would be placed thereon, each liable and able to give several years' effective service.

I think there are good grounds for believing that the inducements offered are such as would lead many to take advantage of them, and thus we should at once begin to create a Reserve—trained in the Navy—which would, in time, take the place of the Royal Naval Reserve. It might be the beginning of that great national fleet, where all connected with the sea have served an apprenticeship with the State, and once for all set at rest that long-vexed question: the efficient manning of the fleet.

The limits of an essay will not permit me to give more than an outline of such a scheme as I have suggested. Many details would have to be worked out before it could come into operation. It should be applied to the Marine Corps as well; but I believe that in this direction only is to be found the answer to the question—"How to ensure an efficient body of men for a peace and war establishment?"

THE TACTICS OF THE FUTURE.

By Lieut.-Colonel W. A. H. HARE, Royal Engineers.

A Review of Captain F. Hoenig's "Untersuchungen über die Taktik der Zukunft"; with numerous extracts, taken by permission.

PART II.

STUDIES IN MILITARY HISTORY.

(Continued from page 304, No. 217, Vol. XL.)

II.—The Attack of the 19th Half-Division (38th Infantry Brigade) on the Heights of Bruville in the Battle of Vionville (Mars-la-Tour), on the 16th August, 1870.

THE 38th Infantry Brigade, says Hoenig, comprising the 16th and 57th Regiments, together with the 2nd Light and 2nd Heavy Batteries, and the 2nd and 3rd Companies of Engineers of the Xth Corps,[1] under General von Schwartzkoppen, marched from Thiaucourt at 5.30 a.m. on the 16th August. "According to the history of the 1st Dragoon Guards," he observes, "it was preceded at 4.30 a.m. by the Brigade of Dragoon Guards, accompanied by its battery of Horse Artillery (Planitz). This force reached St. Hilaire—the place indicated as the general point for all the troops above named to march on—at about 10 a.m. The officer in command, Count Brandenburg II., hearing the sound of artillery fire to the Eastward, determined, with the concurrence of General von Schwartzkoppen, to ride at once in the direction of the firing. He took with him at first the 1st Dragoon Guards and the battery of Horse Artillery only."

General von Schwartzkoppen, he says, was aware before leaving Thiaucourt that a reconnoitring party had been sent under Lieut.-Colonel von Caprivi, the Chief of the General Staff of the Xth Corps, to ascertain whether the strong force of the enemy which had been observed the day before at Vionville, was still there; and he very likely conjectured that the artillery fire referred to had something to say to this. He remained, however, himself with the 38th Brigade.

"It was an oppressively hot August day," says the author, "but the infantry, nevertheless, marched so well that it reached St. Hilaire soon

[1] The author constantly calls this force the 19th Half-Division.

after 11 a.m. One halt, and that of ten minutes only, had been made at Woël."[1]

According to the author's calculations, the distance from Thiaucourt to St. Hilaire is at least 13¾ miles, but he points out that, according to the history of the 16th Regiment, it is given as 12½ miles only.[2]

He gives the following graphic description of what now occurred :—

"The enemy was supposed to be in retreat on Verdun, and the commanding officers, etc., had consequently been more or less in a state of suspense during the march to St. Hilaire. Great then was our surprise to find ourselves on one of his lines of retreat and see nothing of him. The five battalions, the two batteries, and the two companies of Engineers were formed up to the South-East of St. Hilaire, and covered by outposts of the 2nd Battalion 57th and Trotka's squadron of the 2nd Dragoon Guards. In the meanwhile, the bells of the churches in the neighbouring villages were ringing violently, to announce our arrival to the enemy. We could now see right away up to the heights overlooking the Meuse, so clear was the air; there was not the faintest haze."

"Our position was one of great anxiety, but orders were nevertheless given to cook dinners.[3] The officers, who listened attentively to the roar of the artillery fire in the distance, all thought we should immediately have to advance again. Now, this state of sus-

[1] The author points to various discrepancies in the hours given in the official account, among others, one that the 19th Half-Division left Thiaucourt at 7 a.m., and compares these with the statements given by the regimental histories of the 1st Dragoon Guards and 16th and 57th Regiments. "According to the Dragoon Guards," he says, "Brandenburg's brigade left Thiaucourt at 4.30 a.m., and marched by St. Benoit en Woévre and Woël to St. Hilaire, the 5th Squadron 2nd Dragoon Guards leading as an advanced guard. At St. Hilaire the Count was in the act of placing outposts, when artillery fire in the direction of Metz was heard and increased every moment. He consequently marched in that direction with the 1st Dragoon Guards, Planitz's battery, and the 4th Squadron 2nd Dragoon Guards, leaving the 5th Squadron of the latter as outposts for the 19th Half-Division. He reported then to General von Schwartzkoppen. According to both the other regimental histories, the Half-Division left Thiaucourt at 6 a.m., and arrived at St. Hilaire at 12 noon. The 19th Half-Division must have passed Woël before 10 a.m. It is 3½ miles from this place to St. Hilaire, and this distance could easily have been got over in 1¼ hours. It is therefore perfectly certain that the 38th Brigade reached St. Hilaire before the times given in the official account or the regimental histories of the 16th and 57th Regiments. It was just 11 a.m. by the time of the 1st Battalion 57th Regiment. I was adjutant of the week for the receipt of orders, and watches were daily compared and regulated with the watch of the General Staff officer of the Division, Major von Sherff. The hours I give have certainly then the greatest claim to be relatively considered the most correct."

[2] The author says : "The infantry of the 19th Division had marched without packs since the 9th August. These had been put on the railway at St. Ingbert, under the supervision of an adjutant from each regiment. I represented the 57th. The men afterwards carried their great coats rolled with mess tins attached, and the ammunition taken from the packs was carried in the haversacks."

[3] Not a word is said about this in the official account.

pense" (the author calls it "battle fever") "is nearly always caused by an uncertainty among the troops as regards the general object contemplated by those in command. But in this case there could have been nothing of the kind. Nearly every officer may be said to have fully understood the strategic situation and the object of the march from the morning. It had been the topic of conversation during the march, and very important results were expected. Great was the astonishment then to find St. Hilaire unoccupied by the enemy, though the sound of heavy firing had been heard all along away on our right."

"The order to cook dinners under the circumstances was received by the troops with a considerable amount of surprise, and it enables us at once to understand the view taken of the situation by General von Schwartzkoppen, for it shows that he made up his mind to stay at St. Hilaire and there await orders, and that, though the heavy firing which had then been heard for a long time was increasing in intensity, he thought there would be time to cook and eat dinners before any orders might be expected to arrive. It is of course very desirable to let troops cook a meal at any opportunity, so that they may not have to march and fight on empty stomachs. But General von Schwartzkoppen had not met with the enemy where he expected to find him, and, on the other hand, had heard in his right rear continual heavy firing, showing that the enemy was engaged elsewhere. We have, unfortunately, no means of knowing what the General actually thought himself at the moment of the situation in its minor details. It is clear that he could not have known at the time what was taking place in his right rear, but it is equally clear that he heard the thunder of the guns in the distance, and, nevertheless, did nothing to enable him to come to some conclusion; and yet this is the first thing a General should do, as soon as he recognises that the supposition under which he has received his orders turns out to be incorrect. Now, Count Brandenburg was impressed with this idea as early as 10 a.m., and acted in accordance with it, reporting at the same time to General von Schwartzkoppen. No idea of cooking entered his head, but his sole thought was of marching in the direction of the firing; consequently we are justified in saying that General von Schwartzkoppen should have come to the same conclusion, and all the sooner as the Count had put him on the right track."

"The roar of the cannonade was still continuing in intensity when single-mounted men were seen approaching from the Eastward. This put us all on the *qui vive*, and so convinced were we on the right of the 57th that we were to immediately advance, that the men actually poured their boiling soup on the ground before they received the order to do so; but the bugles only sounded when an officer arrived with his horse in a lather; all the kettles were then emptied and the troops set in motion. It was 12 noon,[1] and the direction of our march was given as

[1] 12.30 p.m., according to the official account; and shortly after 12.30 p.m., according to the 16th Regiment. The time is not given by the 57th.

Chambley. We could hardly believe our eyes when we found the place on the map. The following was the order of march: the 4th Squadron 2nd Dragoon Guards,[1] the Fusilier Battalion 16th,[2] the 2nd Light Battery, the 1st Battalion 16th, the Second Battalion 16th, the 2nd Heavy Battery, the Fusilier Battalion 57th, the 1st Battalion 57th, and the two Engineer Companies. The 2nd Battalion 57th and a few orderlies of the 4th Squadron were left to protect the trains of the Brigade to the North-West of St. Hilaire."

"We must now," says the author, "take a look at the situation as understood at headquarters of the IInd Army. It was believed that the French would make every effort to reach the left bank of the Meuse unmolested, and the object to be attained was therefore to be beforehand in reaching this river with the main portion of the IInd Army. With this view, orders were issued at 7 p.m. on the 15th. The smaller portion of the IInd Army—the IIIrd and Xth Corps, with the 5th and 6th Cavalry Divisions were given in the same orders a different direction to march in, and this contained in itself a tactical *Auftrag*. Thus, on the 16th, the IInd Army marched asunder in two different directions, the greater portion going in a Westerly direction, and the smaller portion in very nearly a Northerly one. The latter was intended to attack a strong rear guard of the enemy supposed to be marching on the Metz—Vionville—St. Hilaire road. It was afterwards to follow the main, or greater portion, to the Westward, according to circumstances. But, as a matter of fact, something very different happened. The smaller portion, or right wing, of the IInd Army, came across the whole of the French Army, and the greater portion, or main body, had to abandon the direction it was marching in and come to its assistance. A closer examination of these interesting events and the results that followed need not be given here. If the reader wishes to study them in detail, he is recommended to do so in Nos. 71-78 of the *Militär-Wochenblatt* of 1891. It is only necessary to state here that the IIIrd Corps was ordered to march on Vionville (Mars-la-Tour), and the Xth Corps on St. Hilaire."

"The question of the view taken of the situation by General von Schwartzkoppen," the author thinks, "requires careful examination. General von Voigtz-Rhetz knew that the enemy was not far West of Metz on the 15th. It had been reported to him by the 9th Dragoons from Novéant, and this prompted him to hint at the measures that should at once have been taken. The General commanding the IInd Army and the Generals commanding the Xth Corps and 19th Division were in Pont à Mousson on the 15th. A discussion took place between Prince Frederick Charles and General von Voigtz-Rhetz on the 'intentions of the enemy and our own intentions,' but whether General von Schwartzkoppen took part in this discussion I cannot say.

[1] One squadron was with General von Voigtz-Rhetz commanding the Xth Corps; another was attached to the horse artillery division of the Corps, and another was with General Count Brandenburg.

[2] This battalion turned off at Suzemont, to the South, to maintain connection by way of the Farm of Mariaville with the remainder of the Xth Corps.

The discussion was, of course, limited to what the Prince knew, or assumed to know, of the enemy's movements, until the receipt at 10.30 a.m. on the following day of General von Moltke's directions. But it was sufficient to turn General von Voigtz-Rhetz's attention more in a Northerly than in a Westerly direction, for he believed that, as the French had been reported on the 15th as extending from Metz to Rezonville, the Xth Corps might, very possibly, be called upon to reach the great *chaussée* at some point to the Eastward of St. Hilaire. It is not to be supposed that General von Voigtz-Rhetz withheld the conclusion he had arrived at from General von Schwartzkoppen, and as the latter was on the extreme left, and consequently in the most difficult position, he ought to have endeavoured from the very beginning to keep up communication with the troops on his right, or East side, which General von Voigtz-Rhetz had despatched in that direction, and that he had done this General von Schwartzkoppen knew perfectly well."

"It is always one of the most important things in warfare," the author goes on to remark, "to maintain communication between columns moving separately, especially when, as in the case in point, they are so far apart and the situation is beset with such uncertainty. General von Schwartzkoppen, should have made use from the very commencement of his march, of the numerous cavalry he had with him. Half a squadron would have sufficed. But this most important measure was neglected, the result being that one column knew nothing whatever of what the other was about. And from the moment that heavy firing was heard to the Eastward, the neglect of this precaution was all the more inexcusable!"

"General von Voigtz-Rhetz was instructed to attain the line St. Hilaire—Maizeray with the Xth Corps; and the portions of this Corps still at Pont à Mousson or in the valley of the Moselle were to make every endeavour to join him. Now, considering that the General differed somewhat in opinion from the view taken of the situation by the Prince, he carried out the order given him with consummate skill. He merely sent the 19th Half-Division with the Brigade of Dragoon Guards to St. Hilaire, in connection with a reconnaissance in force towards the camp of the enemy which had been observed the evening before at Rezonville. The 5th Cavalry Division was to carry out this reconnaissance. But, thinking this hardly sufficient, he sent in addition his Chief of the General Staff, Lieut.-Colonel von Caprivi, with two batteries of horse artillery and a squadron of the 2nd Dragoon Guards from Thiaucourt to Xonville. At the former place there were the 91st and the 1st Battalion 78th, and at Novéant the 2nd and Fusilier Battalions 78th, the 1st Light Battery, and the 1st and 3rd Squadrons of the 9th Dragoons. These two forces were to unite at Chambley and act as a support to the reconnaissance. The 20th Division was ordered to march on Thiaucourt."

"Chambley and Xonville are," says Hoenig, "about 3⅛ miles South and South-West, respectively, of Mars-la-Tour. Thiaucourt is about 11¼ miles, and St. Hilaire 9⅜ miles from the same place. The road Chambley—Xonville—Suzemont runs about parallel with the road St. Benoit—St. Hilaire, and roughly about 9⅜ miles from it. Now, if we take the point

on which the IIIrd Corps was marching as half-way between Vionville and Mars-la-Tour, we can see from these dispositions of General von Voigtz-Rhetz his view of the situation and his intentions standing out in bold relief. He wished to comply with the orders of the Prince, but at the same time to extend as little as possible in a North-Westerly direction, so as to be able, in case of necessity, to support the IIIrd Corps at the shortest distance with three-fourths of the Xth Corps. The arrangements then we have described, seeing the distances given, fully enabled this to be carried out on the 16th with three-fourths of the Corps, but it is certainly questionable whether the 19th Half-Division, could have supported as well in time, if it had reached St. Hilaire. Consequently, as these arrangements were known to General von Schwartzkoppen before he left Thiaucourt, it was his duty not to have lost sight of the view taken of the situation, as matters progressed, for one moment. And he could only have been in a position to do this by keeping up communication with the road Chambley—Xonville—Suzemont. It might possibly be argued whether this was General von Voigtz-Rhetz's or General von Schwartzkoppen's business. In my opinion, it was decidedly the business of the latter, for he commanded the column, and General von Voigtz-Rhetz only accompanied it, and he was, besides, excessively jealous of his prerogatives."

"Now, seeing," he says, "the precaution of having cavalry between the roads on which the Xth Corps was marching was neglected, steps should have been at once taken to ascertain how matters were going on, directly it was evident beyond all doubt that serious fighting was taking place, more especially, indeed, as no enemy was to be seen in St. Hilaire or the neighbourhood. Any amount of scouting parties, etc., could easily have been sent before 10 a.m. in the direction of Chambley, Xonville, and even Thiaucourt, to find out and report to General von Schwartzkoppen on the view taken of the state of affairs, and the action contemplated, from time to time at these places. The situation at St. Hilaire was clear enough, and every endeavour should have been made to ascertain, especially in the direction of Xonville, the results of Lieut.-Colonel von Caprivi's expedition."

Hoenig now quotes the official account to show that his opinions and arguments are right. According to this, he says, "Firstly: General von Kraatz, hearing the roar of the artillery fire, sent officers' scouting parties in a Northerly direction before he reached Thiaucourt with the 20th Division at 11.30 a.m. Thus," he maintains, "General von Schwartzkoppen should have done the same. General von Kraatz, from what he heard, at once struck off in the direction of the firing with his Division. As regards the importance of obtaining information, this," he adds, "is a case in point. Secondly: At Novéant there was the force comprising the 78th, etc., I have alluded to, which was to join the 91st (*minus* the 1st and 2nd Companies), the 1st Heavy Battery, and two squadrons of the 9th Dragoons at Chambley; the officer commanding the latter force employed half a squadron to keep up communication with the force in Novéant. This," he goes on to say, "is a case in point as regards the

importance of keeping up communication between columns on the march. Thirdly: At 11.30 a.m. the 20th Division was at Thiaucourt, and the force 91st, etc. (Colonel Lehmann), was at the disposal of the IIIrd Corps as early as 11.45 a.m., as the result of the firing having been heard at Chambley. Now it is rather over 4 miles from Chambley to Vionville, consequently Lehman's force was certainly clear of the former place by 10 a.m. Had General von Schwartzkoppen then sent officers' scouting parties from the outset to obtain information in the direction of Chambley, they would have ascertained that this force was marching in a North-Easterly direction, and he would have known at the very latest by 10 a.m., that it was also marching from Chambley in the direction of the firing. Consequently, by maintaining communication a report would have been received from the decisive direction! The force from Novéant only received the order to march on Chambley when it was following the 5th Division, for when the officer commanding it heard at Gorze the continued thunder of the guns in the distance he also marched towards the scene of the engagement."

"Thus," he points out, "we find all the officers in command of columns, with one exception, *deviating from the orders given them for the day on their own responsibility and following independent conclusions!* Count Brandenburg marched from St. Hilaire at 10 a.m., on account of the firing, the 19th Half-Division being a good hour's march in rear (rather South of Woël); Colonel Lehmann left Chambley about 10 a.m. for a similar reason; Colonel von Lyncker Novéant rather before this; General von Kraatz Thiaucourt at 11.30 a.m.; and Lieut.-Colonel von Caprivi Xonville. General von Schwartzkoppen alone failed to do anything of the kind, although he knew that no enemy was to be seen near St. Hilaire. Now, as his Brigade was the furthest to the Westward, it was more than ever imperative on his part to be at hand. He should have taken steps to insure this, and they certainly were of a very simple kind. Had he even arrived too late on the scene from one cause or other, he still would have acted on sound principles as a General. Mars-la-Tour is $9\frac{3}{8}$ miles from St. Hilaire. Had the 5th Cavalry Division been properly employed, it could certainly have brought General von Voigtz-Rhetz (and Schwartzkoppen) the desired information, at the very latest by 10 a.m., on the road to St. Hilaire. The Prince in Pont à Mousson received the first intimation of what was going on at Vionville from General von Alvensleben as early as 10.30 a.m., and this place is some $3\frac{3}{4}$ miles further from Pont à Mousson than the road Thiaucourt—St. Hilaire. The result of this neglect was the unfortunate position in which the 19th Half-Division found itself, for we all know how easy it is to forget to send information in the heat of an engagement."

"I maintain, therefore, from the above," says Hoenig, "that what I have said from the first is right, and that is, that General von Schwartzkoppen was wrong in ordering his men to cook dinners; and my opinion is further confirmed by the fact that the 20th Division, which was much further in rear, and had a much longer march

to reach the battle-field from Thiaucourt than had the 19th Half-Division from St. Hilaire, did nothing of the kind, but marched and reported. The circumspection, indeed, of the General commanding this Division, and the substance of his reports to the General commanding the Corps may be taken as perfect of their kind. He also sent word to the 19th Division that he was marching to the battle-field. Do we find anything of the kind done by the General commanding the 19th Division as regards the 20th Division? And should he not have taken the lead in such matters, seeing he was so strong in cavalry?"

"The IIIrd Corps," he adds, "was marching in the direction of Mars-la-Tour—Vionville. But the French might very well have been beyond (West of) the former place when the Corps reached the great *chaussée*. The fighting might then have been much nearer than $9\frac{3}{8}$ miles, and it is well known how deceptive the sound of firing is, owing to weather and the direction of the wind."

"It was the intention," says Hoenig, "of the General commanding the Division, up to his arrival at Suzemont, to fall on the enemy's flank by Ville sur Yron; but on reaching the former place he thought the direction too risky. Only long lines of fire and thick clouds of dust could be seen from horseback; but the intensity of the firing and the numbers of wounded belonging to the Xth Corps that were now met with coming in the opposite direction, and who gave anything but re-assuring accounts of the state of the fight, may have induced him to first of all try and close on the other portions of the Xth Corps."

The author now describes the increasing stream of wounded that were met with. These gave a bad account of the fighting. One, an officer, who was badly wounded—shot through the breast—said, "I hope you will have better luck than we have had. It will be a surprise for you. It is not the sport of 1866."

He next points to certain errors in the official account and Regimental Histories as regards time and place concerning the march of the 38th Brigade, to go into which space forbids us; but he is positive that the Brigade marched from St. Hilaire to a point about 1,000 yards South-West of Mars-la-Tour without a check, and reached this point at the very latest by 3.30 p.m., where it formed up facing Tronville. He quotes several incidents which fix his memory.

"After passing Suzemont, Generals von Schwartzkoppen and von Wedell (38th Brigade) rode on ahead," he says, "to ascertain how matters stood and to examine the country. But the latter should have been perfectly well known, for Count Brandenburg had been facing the enemy with four, and afterwards five, squadrons of cavalry and a battery of artillery on the plateau between Bruville and Ville sur Yron from 12 noon. On the advance, however, of the French IVth Corps d'Armée against the left wing of the IIIrd Corps (on a front from St. Marcel to the Farm of Greyère), the Count was obliged to retire on Mars-la-Tour, which place he reached at 3 p.m. Thus it is absolutely certain that the French IVth Corps d'Armée only became engaged by 2 p.m.,

consequently the Count must have been in the best position to know the character of the country and the strength of the enemy's forces, and should have reported accordingly. The 13th Dragoons should similarly have sent in reports. But the fact that no reports reached General von Schwartzkoppen shows at any rate that the matter was not sufficiently attended to."

"Up to 2 p.m. the German line of battle had extended from the Northern edge of the Bois de Tronville obliquely across the road Gravelotte—Mars-la-Tour—Verdun, but was after this pressed back to that road. The French Division (Grenier) had gained possession of the height 846[1] at 2 p.m., and at 2.30 p.m. the Northern edge of the Bois de Tronville[2]. This Division was gradually reinforced up till 4 p.m. by fractions of Cissey's Division in the direction of the Farm of Greyère, but pressing ahead of this place the 5th Battalion of Chasseurs of Grenier's Division had seized the patch of wood in the angle formed by the junction of the two streams North of Mars-la-Tour, about 2 p.m., where it was afterwards reinforced by the 98th Regiment. Now, though the French cavalry near Ville sur Yron showed but little enterprise, still it had observed and reported to General Ladmirault the advance of the enemy (the 38th Brigade) on his right flank. Upon this the General ordered the above movement and lost no time in occupying the strong natural position North of Mars-la-Tour."[3]

"The height 846," the author points out, "was the strategic point of the battle-field on the French right wing, North of the road Vionville—Mars-la-Tour. It commands the ground in every direction in the vicinity, and is exactly in a line with Flavigny—Vionville—Bois de Tronville—Bruville; from it the French searched Mars-la-Tour with their fire, and swept the whole battle-field of the 38th Brigade. As we had not been beforehand in seizing the height 846, any attempt to take it by storm should never have been entertained. It was certain to end in failure."

"That a single weak Brigade," he continues, "far away on the flank of an enemy so strong in position and numbers, should have advanced to the attack, threatening his line of retreat, is such an extraordinary proceeding that it must have filled him with consternation. For, watching its advance from the height 846, he was bound to assume that it was merely the advanced guard of superior forces coming from the same quarter, and if we put ourselves in the enemy's position, we do not see very well how we could have come to any other conclusion, as any explanation of our extraordinary proceedings must certainly have been difficult beyond any thing. The French could not possibly have supposed that they were going to be attacked by a single Brigade coming in this direction. It is important that the

[1] For all topographical features see maps in official account.

[2] The French, however, never occupied the whole wood, but only its Northern portion. The undergrowth indeed was so thick in places as to be impassable, or at any rate could only have been penetrated with the greatest difficulty, and General Grenier probably avoided it purposely for this reason.

[3] He was also urged to do this by Marshal Bazaine.

circumstance should be most carefully noted, otherwise it is impossible to explain the sudden collapse of Ladmirault's offensive movement in the battle just at the very moment when he was successful and held the fate of the French Army in his hands. Again, besides the above considerations, he had taken certain prisoners of the Dragoon Guards, and this confirmed his impression that the Prussian Guard Corps would soon appear on the scene. (See the Reports of Bazaine and von Rohr.)"

"We cannot, however," he says, "let the matter rest here. It behoves us to examine this incident to which so much interest attaches, with a view to coming to some sort of conclusion as to how matters would or might have gone, had General von Schwartzkoppen taken it into his head to have gone into the question more thoroughly. The force which he commanded stood ready to advance at St. Hilaire shortly after 11 a.m.[1] He could, consequently, have then marched from that place. *Ought he to have done so?* Yes, I say, undoubtedly, provided he immediately sent word to that effect. General von Schwartzkoppen had orders to march on St. Hilaire. He sanctioned the departure of Count Brandenburg, but remained himself behind at a moment when all doubt as to the general strategic situation, which had till then remained uncertain, was cleared up by the action that was proceeding. Again, when he only made up his mind to divide his force, he should not have ordered 'a portion of the cavalry is to remain here,' whilst he had to at once direct his infantry and artillery on the sound of the firing. Cavalry were afterwards wanted, and it could perfectly well have reached Mars-la-Tour by 2 p.m. Consequently it may be maintained, that not only the situation, but the *rôles* of cavalry and infantry as well, were misunderstood, for cavalry were used as infantry and infantry as cavalry!"

Had General von Schwartzkoppen marched, he points out, at 10 a.m. from Woël to Mars-la-Tour after he was informed that no enemy was to be seen near St. Hilaire, the 19th Half-Division could certainly have very well reached the battle-field at 1 p.m., and the question of occupying the height 846 might then have been considered.

At 3.30 p.m., according to the author, the Half-Division reached the point assigned it South-West of Mars-la-Tour. "This village is commanded," he adds, "on its North and West sides. It was then an insignificant little place, and was occupied by a few chasseurs à cheval. These cleared out at our approach."

The following remarks of the author on the scene of the engagement refer to the maps of the official account:—

"The distance from the Bois de Tronville to the road Mars-la-Tour—Jarny is about 2,700 yards, and that from the French position (height 846—Farm of Greyère) to the road Mars-la-Tour—Vionville much about the same.

[1] The hours given are those noted by the author himself on the very day by order of Lieut.-Colonel von Roell (1st Battalion 57th). His sabre-tache was lost when he fell wounded, but it bore his name and other evidences of ownership. It was afterwards found on the field of battle near Lieut.-Colonel von Roell's dead body, and sent by the battalion to the owner when in the field hospital.

A depression beginning East of Mars-la-Tour runs round the North side of the village, and then turns sharply to the North. In its further course it is known as the Yron. Another depression, beginning on the East of the Bois de Tronville, runs North of this wood in a Westerly direction, and joins the former depression about 650 yards South of the Farm of Greyère. The average distance of this depression from the French position (height 846—Farm of Greyère) is about 700 yards. Its sides are gentle at first, but from the Bois de Tronville they become abrupt, and about half-way between this and the Farm of Greyère average 39 feet in height, the mean width at the depression at the bottom being some 197 feet. The depression running North is much the same in character, but its width at the bottom is far greater. Both were dry and hard on the day of the battle. The highest point in the French position was the height 846, the ground sinking gradually to 720 on the West. Two roads crossed the position obliquely, one going from Bruville to Mars-la-Tour, and the other from the same place to Vionville, diverging in front of it. The position not only commanded the field of battle on the (German) left wing, but had in front a serious obstacle to the movement of troops, and it could only be reached, except in the open, from the Bois de Tronville on the right, and the depression running North, which we have described, on the left. Otherwise the whole space lying in the square of 2,700 yards aside, was practically without cover. The general surface of the ground has a tendency to fall in the direction of the road Mars-la-Tour—Vionville, after which it rises gently again to the South."

"Our best direction of approach was the depression running North from Mars-la-Tour. But General Ladmirault had perceived this, and closed it by holding the little patch of wood we have already referred to with the 5th Battalion of Chasseurs. Consequently the French position could not be turned on this side before the wood was taken. South of the ravine, in front of the French position, and some 95 yards or so from its edge, was a bank and hedge some 160 yards or so long, running in an Easterly direction from the road Bruville—Mars-la-Tour. It played an important part in the action, and that is why I draw attention to it. It was the only cover of any kind on the field of battle North of contour 780. The French position was then one which could not be turned and had a free field for fire in front. There were other serious obstacles to our movements, which we found out later on to our cost, and are not mentioned in the official account.[1] In the depression North of Mars-la-Tour there were meadows divided in plots by wire fencing, extending from the road Mars-la-Tour—Vionville to contour 780, covering thus some 360 square yards. Though all this ground was not exposed to the enemy's fire, still cutting passages through the fencing entailed loss of time and certain confusion, and, in the case of the 57th Regiment, serious losses from artillery, mitrailleuse, and infantry fire."

[1] It is only mentioned in connection with the charge of the 1st Dragoon Guards, whereas the infantry had chiefly been checked by it."

The character of the ground, the details of which the author has alluded to, and which were not shown on the General Staff map, was, he says, unknown to the troops, in addition to which the five-and-a-half battalions of the Brigade were so quickly deployed that no time could be spared to look about for such things. "But," he goes on to say, "those in command should have known all about it, for the ground had been entirely in the possession of the Germans up to 2 p.m. They could, indeed, have known all about its character and the enemy's strength as well. But if nothing was known as regards the latter before the order was given to attack, his deployed masses could be pretty easily seen along the whole front with the naked eye shortly before the attack began."

"The Brigade," he says, "had but five-and-a-half battalions for the attack, or rather less than two men per metre. There was in front of them a field of battle extending from contour 780 to the position-height 846—Farm of Greyère, entirely free from cover. To reach the enemy, they had to descend a gentle slope from contour 780 for rather more than 2,000 yards, and cross one unknown obstacle along his entire front and another on a part of it as well. It needed no French and Chassepots on the further side to foresee the hopelessness of such an undertaking. Theory may blame the way in which the attack was carried out, but in spite of this the tactical, and especially the moral, effect of the attack on the enemy was enormous, from the desperate and determined way in which it was attempted. The energy of the assailants increased General Ladmirault's apprehension that they were being followed by further German forces from St. Hilaire. His concern for his right flank engaged his entire attention, and the fear of being attacked in that direction by superior forces prevented him from reaping the fruits of his tactical success. When he was examined before the Commission of Enquiry on the War, he gave as a reason for not following up his success the simple answer: '*pas d'ordres*'!"

The author now describes a curious incident that occurred when the 38th Brigade had been formed up South-West of Mars-la-Tour. The chaplains, it appears, addressed the troops before battle. The Protestant chaplain, Aebert, he describes as being so affected, choosing his expressions so unskilfully, and speaking to the troops in such a lugubrious tone, that little good, he thinks, could have come from such "spiritual comfort"; and he has come to the conclusion, in consequence, that if a chaplain cannot have at the same time the feelings of a soldier, he does more harm than good on such occasions, and in most cases it is best to keep chaplains away from the troops. "Whilst he was speaking, however," says the author, "a man was seen galloping wildly in a bee line from Tronville. It was the Roman Catholic chaplain Stuckmann. After speaking a few words to Colonel von Cranach (57th), commanding the first line, he raised himself in his stirrups and, addressing the troops, said: 'Comrades, the IIIrd Corps is hard pressed. It will be for you to extricate it. Attack the enemy with vigour, and God will be with you. Amen!'" This, he says, had some life in it, and acted like magic. The

regiments uncased their colours and loaded, and Colonel von Cranach then addressed the men somewhat as follows:—"You have shown on the march what brave fellows you are. Show it now in the fight, and, whatever may happen, carry your colours high and let no Frenchman's hand touch them. *Nun mit Gott.*"

On the arrival of the 19th and 20th Divisions with their Generals on the battle-field, General von Voigtz-Rhetz, the author points out, had three fresh Brigades at his disposal, and with these, seeing the state of the battle at the time, he proposed to disengage the IIIrd Corps by an offensive movement. It was his intention to do this in two directions. First, General von Kraatz was to advance with ten fresh battalions in a general direction through the Bois de Tronville and attack the heights of Bruville; consequently at that stage of the engagement his was a frontal attack. Secondly, General von Schwartzkoppen was to support this attack with the 38th Brigade by a movement on his part in a North-Easterly direction (or on the North-Western extremity of the wood). The latter movement was looked upon at the time by the General commanding the Xth Corps as a flanking one. Thirdly, both movements were to co-operate with each other. "Now, if an offensive movement of the kind were considered sound under the circumstances," says Hoenig, "it was a good idea of the General commanding the Xth Corps to have ordered it; for assuming that the officers directing both movements fully grasped and considered its meaning, the direct line of attack was best covered by an advance through the Bois de Tronville; and had the ten fresh battalions managed to appear on its Northern edge in time, Grenier's Division could not have taken the offensive in the direction of Mars-la-Tour, and would, at any rate, have been checked. The 19th Half-Division had also the Yron depression to advance in, and it afforded cover within certain limits. The success of both movements depended, of course, on the action of the officers in command, and they should therefore have come to an understanding between themselves beforehand on the subject. But in the interval between the giving of the order by the General commanding the Corps and the attack of the 38th Brigade a change took place on the enemy's side, inasmuch as he now prolonged his front to the West to such an extent that had the 38th Brigade advanced in the direction of the Northern extremity of the Bois de Tronville it would not have taken the enemy in flank, but would have been exposed to a flank attack itself. A combined attack on the enemy's masses concentrated at no great distance appears to have been beset on this occasion with exceptional difficulties, for not only was the original idea never attempted, but the ten battalions referred to actually retired at the moment of von Wedell's attack. The contemplated frontal attack consequently never came off, and the attack of the 19th Half-Division was entirely an isolated one. The reasons why the combined attack collapsed at the outset need not be gone into here, but the Generals commanding the Xth Corps and the 19th Division were both put in a most painful position, for they only realised the true state of affairs when it was too late. General von Schwartzkoppen was certainly left in the lurch, and so far cannot be blamed, but there was no

reason why he should not have tried to find out what General von Kraatz was about."

"General von Schwartzkoppen," he adds, "had communicated his intentions to General von Wedell, but all others were in the dark as to what was to happen. Even Colonels von Cranach and von Brixen (16th) were merely given the general direction to advance in. No thorough understanding took place on the spot as was the case at Popowitz (1866), but the whole affair was from the very first of an uncertain and happy-go-lucky character. To show how little officers commanding battalions knew of what they ought to have known, he quotes the words of his own commanding officer, Lieut.-Colonel von Roell, who was afterwards killed in the action. This officer remarked sarcastically at the time: 'If it had not been for Stuckmann (the chaplain), I should have known nothing about it. The little I do know, I gathered from his address. Stuckmann knows all about it to-day, so it appears!'"

"The French soon opened fire," he goes on to say, "but at first we did not know against whom. We were not kept long, however, in doubt on this point. The 2nd Battalion 16th left the place where the Brigade had been formed up, and passing to the West of Mars-la-Tour advanced in the direction of the Farm of Greyère; the 1st Battalion of the same regiment moved through the village. Both battalions then came under the enemy's fire, whilst the Fusilier Battalion 16th and the 1st and Fusilier Battalions 57th, the two companies of Engineers, and the two batteries were still South of Mars-la-Tour and to the West of the *chaussée* leading thence to Les Baraques. The latter force all passed to the East of the village. No attempt was made to prepare the advance by artillery, for the latter only took up its first position South of the road Mars-la-Tour—Vionville, when the infantry (1st and 2nd Battalions 16th) were already under fire. Nor were there any signs of a position being selected for the batteries; nor, indeed, of any orders to the artillery at all. As soon as we reached the great *chaussée* from Mars-la-Tour to Les Baraques, which was planted on either side with poplars, we saw pretty clearly for the first time the enemy's position, extending from the height 846 to the Farm of Greyère, and we were at once assailed by a heavy artillery fire, showing that the French had watched our movements and were only waiting for our appearance in the open. After advancing some 200 paces or so, General von Schwartzkoppen rode up to General von Wedell and Colonel von Cranach, and it was only then that our batteries opened fire from the first position they had taken up. The 38th Brigade was at the moment in one line as follows, from left to right: The 2nd Battalion 16th, 1st Battalion 16th, Fusilier Battalion 16th, 1st Battalion 57th, Fusilier Battalion 57th, and two companies of Engineers. The Fusilier Battalion 16th was somewhat in rear, having come from the Farm of Mariaville. General von Schwartzkoppen had until then remained to the South-East of Mars-la-Tour, and that was the critical time when he had to grasp the meaning of the situation, and make his tactical arrangements accordingly. For beyond all doubt the General commanding the Xth Corps had, up to then, practically commanded himself the left wing of the Corps, and he

looked upon the action of his Corps as being alone able to save the IIIrd Corps from being crushed. To have assumed a defensive attitude under these circumstances would have been fatal to such an object, and it was then essentially a tactical problem how to grasp the situation and make the best of it."

"Now the following questions," he says, "may well be asked:— First, did General von Schwartzkoppen understand the situation? Secondly, did he fully understand the meaning of the order he had received? And, thirdly, did he report the change that had in the meanwhile taken place on the enemy's side (prolongation of his right wing), or did he at any rate pay due regard to this circumstance in making his own dispositions? The first question can never be answered; the second and third are fully answered in the negative by his own acts. There is no doubt that the Xth Corps was ordered to make an offensive movement, but so far as the 38th Brigade was concerned the execution as regards time and circumstances was, owing to the altered state of affairs on the enemy's side, entirely a matter for the General commanding the 19th Division to deal with. His orders should, therefore, have been clear and precise as to how far the attack was to be pushed home and what was to be actually attempted. On the other hand it must be admitted that, so far as the actual handling of the infantry in action was concerned, General von Schwartzkoppen showed that where his presence could be felt, his tactical ideas were sound."

"It was precisely 4 p.m.,"[1] Hoenig says, "when the Brigade began to advance. We had been facing East, and our left wing (2nd Battalion 16th) was nearest Mars-la-Tour. But this battalion had moved straight from the point of assembly South of the village, in the direction of the Farm of Greyère, whereas the companies on the extreme right had to make a long wheel of over 2,700 yards. The whole movement was consequently of an irregular and disconnected character. The 2nd Battalion 16th, indeed, were already firing when the remaining battalions were only commencing the movement, and the general result of this was: first, the battalions arrived successively in the fighting line, and, secondly, those on the right increased their pace to such an extent, to get over the longer distance, as to eventually cause the movement to degenerate into a most hurried affair. But, in spite of every effort to get over the ground as fast as possible, no united effort was possible, and the battalions were singly driven back in succession from left to right, the right wing only arriving completely exhausted on the scene when the battalions of the left wing had already been repulsed."

The author now gives us some personal observations of his own during the movement he has described. He says:—

"Close by the South-Eastern corner of Mars-la-Tour we came across General von Schwartzkoppen and his Chief of the General Staff, Major von Scherff (afterwards the well-known writer). They were both mounted

[1] Von Rohr says the Brigade passed Mars-la-Tour at 5 p.m., and the 1st Dragoon Guards charged at 5.45. The former hour is too late, the latter is right.

and exposed to a heavy artillery fire. Not far from them, but somewhat in rear, were two squadrons of the 4th Cuirassiers. But these, on the fire increasing in intensity, soon went about and retired. The 1st Dragoon Guards took their place, Count Brandenburg II. himself riding along the Mars-la-Tour—Vionville *chaussée*."

"Our men were getting over the ground as fast as they could, and as the skirmishers of the 1st Battalion 57th, with Lieut.-Colonel von Roell riding in line with them, passed General von Schwartzkoppen, the gallant General joined this officer, shouting words of encouragement to the men; and when the enemy's artillery, mitrailleuse, and rifle fire soon became so tremendous as to strike us all with amazement, he quietly turned to Lieut.-Colonel von Roell and said: 'Roell, only extend thick swarms of skirmishers, and we will soon settle them'; and afterwards, 'bring your left shoulder up a little, there, on the corner of the wood,' pointing at the same time to the North-West angle of the Bois de Tronville."

"In the meanwhile, the 1st Company 57th had extended two sub-divisions as skirmishers and taken this direction, so that a gap appeared inevitable between the 16th and the 57th. General von Schwartzkoppen then said: 'Roell, put a whole company in there,' and the 2nd Company 57th was pushed in. But the captain soon had his horse shot under him, and being very short-sighted, and remaining pinned for some time underneath the animal, soon lost all control over his company, which then brought its right shoulder too far forward. This is explained by the fact that the men sought protection from the enemy's murderous fire in the depression which has been described as running round the village. The 3rd sub-division of this company joined the left of the skirmishers of the 1st Company 57th, but the gap between the two regiments was only really closed when Lieut.-Colonel Sannow thrust the Fusilier Battalion 16th in. This battalion had till then been some 165 yards or so relatively in rear of the skirmishers of the 1st and 2nd Companies 57th, but made up for this by taking a shorter cut to the front. I have explained this in anticipation to show how the fighting line was formed, for, when it was afterwards halted, companies of the Fusilier Battalion 16th were found between the 1st and 2nd Companies 57th, which were entirely extended as skirmishers."

"The Divisional Commander gave no further orders during the engagement till he gave the order to retire. The Brigadier rode to the Northward of Mars-la-Tour, and was followed by Colonel von Cranach, and when the 1st Battalion 57th crossed the Mars-la-Tour—Vionville *chaussée* our batteries took up a fresh position North of the village."

"I will now describe what I further saw and heard when near the Divisional Commander. Lieutenant Eggeling, of the Xth Corps staff, had just ridden off, when Major von Scherff pointed to something on his map and looking to the West said to General von Schwartzkoppen: 'That is the 5th Cavalry Division that will support your attack in flank.'[1] The

[1] This officer must consequently have previously informed General von Schwartzkoppen of General von Voigtz-Rhetz's intentions as regards this Cavalry Division.

Division was then trotting to the Southward of and past Mars-la-Tour. Just as the 1st Battalion 57th reached the *chaussée* Mars-la-Tour—Vionville, I detected to my right rear the approach of strong columns (it was the 40th Brigade); somewhat later I saw in rear a staff riding along and on the side of the *chaussée* (it was Count Brandenburg's). Nothing whatever was to be seen of the battle East of the Bois de Tronville. General von Schwartzkoppen now turned his horse in the direction of the Mars-la-Tour—Vionville road and rode away with Major von Scherff."

The author thinks that, before describing any further the details of the attack of the Germans, it is very desirable to follow events on the French side up to this moment, according to what we know at the present day; and to save space, we give his remarks in as condensed a form as possible. He says:—

"When General Ladmirault received the order to engage the enemy, he turned off to the South, Grenier's Division leading followed by Cissey's Division and Legrand's Cavalry Division, with the Reserve Artillery between the latter. The General, after his Corps d'Armée had been given the direction of Bruville to move on, pushed on far ahead with his staff and personally reconnoitred the ground between the Yron and the Bois de Tronville. When at the Farm of Greyère, he deemed it desirable to at first effectually close the two ravines which we have described as uniting near this place. He at once ordered up a battery of 12-pounders, which he himself placed to the West of the farm, so that it could enfilade the valley coming from the South. This battery opened fire as early as 2 p.m. against the four squadrons of the Prussian 1st Dragoon Guards. Next he brought forward the 5th Battalion of Chasseurs to protect his flank, and the 98th Regiment in support to the neighbourhood of the farm. At 2.30 p.m. these troops stood as follows: the Chasseurs to the West of the valley and some 550 yards South of the battery, and the 98th Regiment South-East of the battery. The main body now began to arrive, and he directed it to move due South, or somewhat in the direction of Tronville. It was first of all successful in this offensive movement, but was afterwards driven back by the 20th German Division, and when General von Schwartzkoppen appeared on the scene, had taken up a position on the heights of Bruville as follows: The 13th Regiment was extended as skirmishers North of the ravine with its right some 220 yards from the road Bruville—Mars-la-Tour, behind it was the 43rd Regiment its left overlapping, and further in rear again was the 64th Regiment behind the right wing of the 13th and extending to the road. On the road itself was a battery of mitrailleuses, and there was another battery of these on height 846, both belonging to Grenier's Division."

"By 3 p.m., Cissey's Divisional Artillery had arrived and taken up a position to the West of the Bruville road; the 57th and 73rd Regiments are said to have arrived at 2.30 p.m and were resting with their packs off to the Northward of the 'Greyère ravine.' But the 1st and 6th Regiments, and the 20th Battalion of Chasseurs, together with the Reserve Artillery and Legrand's Cavalry Division, were really the first to arrive. On the

other hand, at 2 p.m. a regiment of Chasseurs d'Afrique, and a regiment of dragoons and one of lancers of the Imperial Guard, were some 2,200 yards North of the Farm of Greyère, and to the West of the road Mars-la-Tour—Jarny."

"Thus the French were already in formidable strength between the roads from Mars-la-Tour to Jarny and Bruville, and to the West of the former before General von Schwartzkoppen appeared on the scene. And though they may have been only partially visible, they had, nevertheless, kept up an uninterrupted fire, both of artillery and small arms, from the Farm of Greyère ever since 2 p.m., the batteries directing their fire on Mars-la-Tour on the appearance of General von Schwartzkoppen. It was, indeed, by this fire that General von Barby and Count Brandenburg had been driven back on Mars-la-Tour by 2 p.m."

The author now thinks that the reader should be given a clear, and general description of how the French line of battle was further increased and extended, and with this object he makes the following observations:—

"Between 4 and 5 p.m., the whole of Cissey's Division gradually arrived in the line of battle, at first the 57th Regiment to the East of and on the Bruville road, and next the 73rd to the right rear of this regiment; these were afterwards joined on their right (West) by the 20th Chasseurs and the 1st and 6th Regiments, the former being in one line and the latter in two lines. I could not exactly say at what time the Reserve Artillery came into action. My impression is, however, that it was about the time we crossed the Mars-la-Tour—Vionville road, and, consequently, when we were already engaged (about 4.15 p.m.); for from that moment the enemy's artillery fire very considerably increased, and it was evident, from the noise of the firing, that his batteries had been reinforced. Besides, with the exception of one battery, all his artillery is shown to have suffered more or less loss."

"Now, it is very likely that, from General von Schwartzkoppen's position (see sketch), it may have been impossible to have clearly seen the strength of the enemy near the Farm of Greyère, and what was taking place to the West of the Bruville road; still, it could be seen that: firstly, the heights of Bruville were throughout their extent strongly occupied; secondly, that a heavy artillery fire continued from the neighbourhood of the farm without intermission, by which Mars-la-Tour was set on fire about 4 p.m.; and thirdly, that a huge cloud of dust had been visible for a very considerable time high in the air and hanging over the country North of the farm. The atmosphere at the time was still and clear."

"The appearance of this immense cloud of dust had been one of the first things to attract and absorb our attention during the day, more indeed even than the enemy's fire, for we had actually noticed it before we reached the point of assembly some 1,000 yards South-West of Mars-la-Tour, and had constantly kept our eyes fixed on it. We were all discussing what it could mean, and my commanding officer, with his uncommonly good sight, maintained that it was steadily moving in a direction from North-East to South-West, and, so far as I could see myself, it certainly moved without a check whilst we were, so to speak, marching round it.

As we approached the position taken up by General von Schwartzkoppen, we could clearly see that the cloud of dust was moving in a South-Westerly direction and on the Farm of Greyère, but that the heights of Bruville were at the same time being slowly occupied. The origin of the dust was consequently still unexplained. What was it? Undoubtedly the movement of masses of the enemy that were still invisible. The effect of the apparition on me was certainly one that I have never before or since experienced in my military career. For, with the heights of Bruville in front of us bristling with the enemy, we had a presentiment that something very serious was soon about to happen in the direction of the Farm of Greyère."

"The enemy was seen to have been considerably reinforced after 2 p.m., and a great deal of commotion observed in his line of battle near Rezonville (withdrawal of the IInd Corps d'Armée and insertion of a Division of the IIIrd Corps d'Armée and Imperial Guard respectively), whilst there was no sign of diminution of strength in his centre. By 2 p.m., we Germans knew positively by the prisoners we had made that we were opposed by the IInd and VIth Corps d'Armée and the Imperial Guard. By 3.30 p.m., the French line of battle had been extended to nearly double its original length—from St. Marcel to the Farm of Greyère—and it was not long before we fully realised the fact that we had the whole of the Armée du Rhin in front of us. On our side we had only by degrees till late in the evening two Corps and one Division with two Cavalry Divisions. But we had stopped the enemy's retreat. Flavigny, Vionville, and Mars-la-Tour were in our hands, though the Bois de Tronville had been temporarily abandoned by our left wing after 2 p.m., as it had been outflanked there by two fresh French Corps d'Armée—the IIIrd and IVth."

"Thus, between 2 and 3.15 p.m., our position had been an excessively critical one, for at every moment a forward movement of the enemy across the Mars-la-Tour—Vionville road was to have been expected. The 38th Brigade only reached Mars-la-Tour when these terrible hours of anxiety were over, for the French had cleared out of the Bois de Tronville by 3.15 p.m. Grenier's Division had, in fact, about this time advanced with its left wing and several batteries to the Westward of the Bois de Tronville, as far indeed as to be in line with the Southern edge of its Northward portion. Fired on, however, by the artillery of the 20th Division under Colonel von d. Goltz, which had been pushed to the front, it retired to the position-height 846—Greyère Farm. Colonel von d. Goltz continued the fight from the place where the French batteries had shortly before stood in action—about 650 yards North of the Mars-la-Tour—Vionville road. Two battalions of the 79th were in the wood itself, and the remainder of the 20th Division moved into position. The batteries of the 40th Brigade now joined those of Colonel von d. Goltz, so that after 3.30 p.m. he had twenty-six guns in action West of the wood."

"The appearance of these troops in his front, together with the news that the Germans were advancing against his right flank from

Hannonville, and the orders of Marshal Bazaine to maintain the position he held, were the chief reasons for General Ladmirault's defensive attitude. But there was no reason to suppose at the time that the French would not resume the offensive later when they felt themselves strong enough."

"It was General von Voigtz-Rhetz's intention to assume the offensive against the new forces of the enemy, and at 3.30 p.m. he issued orders to that effect. His plan was to attack the enemy in front with the 20th Division, whilst the 38th Brigade attacked his right wing, and the 5th Cavalry Division acted on the extreme German left according to circumstances."

"Now the officer commanding the 20th Division mistook these orders, or at any rate did not act up to their meaning. The attack was consequently not carried out in the way as was intended, *for of the fifteen-and-a-half battalions that were to carry out the attack, ten, viz., those of the 20th Division under General von Kraatz, retired owing to some misunderstanding at about the same time as General von Schwartzkoppen had, according to instructions received, committed the 38th Brigade to an advance.*"

The italics are the author's. But we confess we should like to hear something more from him on the extraordinary failure on the part of the 20th Division to carry out its part of the programme. He is, however, silent on the subject.

Hoenig now gives the following description of the situation just before the attack:—

"Prince Frederick Charles left Pont à Mousson at about 2 p.m., and reached Vionville as early as 4 p.m. (over sixteen miles.) His intention was to remain on the defensive on the right wing, and to attack the heights of Bruville with the left (Xth Corps), and this agreed with the measures already taken by General von Voigtz-Rhetz."

"General von Schwartzkoppen had received the order to second the frontal attack of the 20th Division by a flanking movement. He was unfettered as regards the way in which he was to carry the order out, but he had to co-operate with the 20th Division, await the development of its attack, and keep an eye at the same time on the enemy. The position the General had chosen for himself enabled him to do this effectually, for the crisis he had witnessed was then over, and at 4 p.m. he was no longer called upon to undertake anything of an urgent nature, for the enemy appeared to have assumed an expectant attitude."

"Considerable changes had, however, taken place on the enemy's side since General von Schwartzkoppen had received the order to attack. These General von Voigtz-Rhetz could not see for himself from his position at Tronville, that is to say, that the French had in the meantime extended their right wing to the Jarny road, and advanced to the Farm of Greyère. Now, granting that General von Schwartzkoppen could not from his position get a sufficiently accurate insight of the strength and extension of the French right wing, still it is difficult to imagine that the movements of the enemy we have just alluded to could have entirely escaped his observation. Having a general view of the wide extent of ground between the Jarny road and the Bois de Tronville, he must have

recognised that five-and-a-half battalions were far too small a force to attempt an attack on a position of such length, and that if he made the attempt he would, in spite of everything, in all probability unduly extend his front and run a serious risk of being outflanked himself. Under the circumstances then a timely representation of the state of affairs to General von Voigtz-Rhetz would very likely have led him to modify his order. But no such report or information was sent, and—what is far worse—General von Schwartzkoppen never waited for the attack of the 20th Division."

"To carry out the attack of the 38th Brigade, General von Schwartzkoppen directed the right wing (1st and Fusilier Battalions 57th and the two Engineer companies) on the North-West angle of the Bois de Tronville, but on the other hand he directed the left wing (1st and 2nd Battalions 16th) to move in a Northerly direction on the Farm of Greyère. Now the outcome of this advance by wings was: the Fusilier Battalion 16th and the 1st Battalion 57th had to advance in a North-Easterly direction in the interval. The Brigade having thus been set in motion, the attack began without any certain knowledge of the extension and strength of the enemy's right wing, and yet this blunder was repeated, as is well known, on a larger scale two days later at St. Privat."

"The Brigade had originally formed up some 1,000 yards or so South-West of Mars-la-Tour, facing Tronville on its full front of deployment, and as its wings were now given objectives very far apart, one to the North and the other to the North-East, and there had been no change of front facing the line Greyère Farm—Bois de Tronville, as a preliminary measure, a disconnected movement was inevitable. The fact that General von Voigtz-Rhetz had sent the 5th Cavalry Division to the neighbourhood of Ville sur Yron to act against the French right wing whilst it was to be attacked by the three Brigades, must be considered as a step taken by him more likely from a general view of the situation than as the result of any reliable information on the movements of the enemy supplied him by Barby's Brigade. Barby's reports were sent to the General Commanding the Corps, and were very likely not communicated to General von Schwartzkoppen, or at any rate not in time. It is only fair and just then to bear this in mind when criticising this General's doings. Now, Count Brandenburg had added his force to that of Barby's in its wide sweeping movement round Mars-la-Tour at about 3 p.m. Consequently, the German cavalry had been uninterruptedly in touch with the enemy from the time of his advance from Doncourt, and, what is more, no fault can be found either with the observation it kept of the enemy or with the reports it sent in. Two hours, however, elapsed before the 38th Brigade attacked, but no proper system of transmitting the intelligence obtained appears to have been observed, nor was anything apparently done to check and compare the news sent in, and this was of the utmost importance to the wings. Thus it can be easily explained why General von Schwartzkoppen, who should have been fully informed of all that was going on, and to whom, as senior officer present on the left wing, all reports should have been sent—even if it

were only as the proper channel of communication—was not in a position to carry out what, under the circumstances, would be expected of the senior officer present on both the tactical and strategic wing of a large force in contact with the enemy. This is again another instance, among so many others, of the extreme importance of a well-regulated system of transmitting intelligence."

The author now describes his personal experiences in the attack, and they are by no means devoid of interest and intelligent power of observation. He first of all observes that just as disconnected as was the attack of the 38th Brigade in conjunction with the troops of the Xth Corps on its right or East, so as a matter of fact was that of the different battalions belonging to it. He says:—

"I was riding from first to last fairly in the centre of the fighting line, and I had a very good view of all that was taking place, until the smoke was so thick that I lost sight of the 1st and 2nd Battalions 16th, so I only now speak of what I actually saw."

"The battalions pushed forward one by one from left to right in a Northwardly and North-Easterly direction, whilst both batteries supported the movement by their fire from the second position they had taken up North of Mars-la-Tour. But as the battalions on the left (the 1st and 2nd/16th) had the shortest distance to go, they naturally outstripped the others, crossed the Bruville ravine, and then clung to the ground they had thus won till the end of the action. The struggle, however, to this end, led by Colonel von Brixen, was of an entirely isolated character. Now, the troops on the extreme right, viz., the Fusilier Battalion 57th and the two Engineer companies, had to make a very long wheel, in fact, one of something like 2,600 yards or so, to reach the Bois de Tronville. It is, therefore, not surprising that the right wing was at least one hour behindhand in coming into line of battle compared with the left, in spite of the marching-powers of the troops being taxed to the utmost. The supports of the two battalions in the centre (9th and 12th Companies 16th and 3rd and 4th Companies 57th) moved forward in alignment, whilst the skirmishers of the 2nd Company 57th got mixed up with those of the 10th Company 16th (see sketch No. 3)."

The following, according to the author, was the formation of the Brigade from left to right (given in companies of regiments) until it reached 780 contour:—

Left Wing—

First Line:

5th/16th, 7th/16th, 3rd/16th, 2nd/16th, 11th/16th, two sub-divisions 2nd/57th, 10th/57th, and one sub-division 2nd/57th.

A distance of 165 yards or so.

Second Line:

8th and 6th/16th, 4th and 1st/16th, 12th and 9th/16th, and 4th and 3rd/57th.

Right Wing—

First Line:

Three sub-divisions 1st/57th extended as skirmishers to the Bois de Tronville.

A distance of 165 yards or so.

Second Line:

11th and 9th/57th, 12th and 10th/57th, and the two Engineer Companies.

From this point and the ground immediately North of Mars-la-Tour the formation changed as follows, a continuous first line being formed and the second pushing into it where there was room.

First Line:

5th/16th, 6th/16th, 7th/16th, 8th/16th, 4th/16th, 3rd/16th, 2nd/16th, 11th/16th, 1st/16th, two sub-divisions 2nd/57th, 10th/16th, one sub-division 2nd/57th, 12th and 9th/16th, one sub-division 1st/57th, 11th and 9th/57th, one sub-division 1st/57th, 12th and 10th/57th, and one sub-division 1st/57th.

A distance of 220 yards or so.

Second Line:

4th/57th, 3rd/57th, and the two Engineer companies.

He goes on to say:—

"No very great losses were experienced up to contour 780, but, as we advanced further to the Northward, we distinctly saw a force from Grenier's Division (Lieut.-Colonel von Roell estimated it at six battalions) advancing due South. It moved rapidly at a run down the slope, and reached the Northern edge of the ravine before we came within some 90 or 110 yards of it. To oppose this force we had the greater portion of the Fusilier Battalion 16th, the 1st Battalion 57th, the Fusilier Battalion 57th, and the two Engineer companies."[1]

"The 2nd and 1st Battalions 16th found the opposite edge of the ravine unoccupied by the enemy, for Cissey's Division was then only beginning to advance between the Farm of Greyère and the Bruville road. I could see them plainly from horseback where I was with the Fusilier Battalion 16th and the 1st Battalion 57th. The right and centre of the Brigade was now exposed to two tiers of a tremendous fire, one from the Northern edge of the ravine and the other from the high ground between height 846 and the Bruville road. Our losses increased at every moment, and we were soon taken in flank ourselves from Greyère by the very troops (Cissey's Division) we had hoped to outflank. Three French Brigades advanced to meet us in deployed lines at 5 p.m., and these were subsequently reinforced by half a Brigade (of Cissey's Division) and a

[1] This arose from the fact that Fusilier Battalion 16th, coming from the Farm of Mariaville, only reached its alignment after the 1st and 2nd Companies 57th had thrown out their skirmishers South of the Mars-la-Tour—Vionville road by General von Schwartzkoppen's order. The battalion pushed forward exactly between the left of the skirmishers of the 1st Company 57th and the right of those of the 2nd Company, and kept this direction, thus breaking up the 1st Battalion 57th as a unit.

battalion of Chasseurs (of Grenier's Division). The French had till then lain flat on the ground, and nothing could be seen of them except occasionally the peaks of their *képis*, and they fired with destructive effect on our troops on the bare ground. At some 90 or 110 yards from the ravine, our line from Fusilier Battalion 16th to the right, came to a halt and tried to answer the enemy's fire. From this moment the attack came to a standstill, the men lay on the ground, but that gave them no cover, two-thirds of their officers were down, and the body, thus deprived of its soul, gave way. They held their ground for a time, and then came the inevitable—they turned and bolted!"

The following is, according to the author, a *résumé* of what took place :—

1. The five battalions never crossed the Mars-la-Tour ravine to storm the French position; as out of 20 companies only 8 (1st, 2nd, 3rd, 4th, 7th, 8th, and 11th / 16th, and 2nd / 57th) reached its Northern edge. The 16th had, as we have already explained, commenced the action before the centre and right of the Brigade, and had the shortest distance to go. It had not to face a position selected and prepared by the enemy, as was the case with the remainder of the Brigade, and it anticipated the French in reaching the Northern edge of the ravine. It was only when attacked by Grenier's Division at the *pas de charge* that they had to give way before such superior forces.

2. The whole line, with the exception of the companies just mentioned, never got beyond some 100 yards or so of the ravine.

3. Needle gun and Chassepot did not both take their share in the work of destruction. The Chassepot had it all its own way.

4. After the Germans had commenced to retire, the French came within 50, or even 30, yards of them, for they suddenly rushed on through the thick smoke, and the Germans were too exhausted to run away. It was on the left of the Brigade (1st and part of the 2nd Battalion 16th), that the French actually got among the Germans in the ravine itself, and the 16th Regiment then lost some 400 prisoners.

5. It was only during the retreat that the losses were so heavy as to make the men break away. Further details on the losses are given at the end of the chapter.

"When the French lines," says Hoenig, "had arrived to within 160 yards or so of contour 780 the 1st Dragoon Guards appeared on the scene and rode their infantry down. The latter then bolted, masking the front of their own troops, forgetting either to fire at all or firing wildly in every direction, and throwing away their packs and arms. A general pause now took place along the line throughout its whole extent of some 2,700 yards, and even the guns all ceased firing. The action appeared to be over, and our gallant troopers rescued many prisoners."

"Soon after this," he observes, "(it might have been 4.45 or 5 p.m.) we heard the bugles sounding the advance in the Bois de Tronville. They were those of the 20th Division. A few minutes afterwards two groups of the 38th Brigade might have been observed, one in angle

between the Bois de Tronville and the Mars-la-Tour—Vionville *chaussée* and the other about 500 yards East of Mars-la-Tour. The former was the remains of the 57th, under Major von Medem, the latter those of the 16th, under Lieut.-Colonel Sannow. Six batteries were in action North of the road. This was the outcome of our adventure."

"The 38th Brigade," he says, "had marched more than twenty-three miles[1] to the battle-field on an oppressively hot day, but the strength of the men had not given out."

The following are his observations on the formations used:—

"About one-third of the companies were extended as skirmishers at some 2,500 to 3,000 yards from the enemy (about the distance from the Mars-la-Tour—Vionville road to the French position height 846—Farm of Greyère).[2] The formation of each company of the first line was at first two sub-divisions extended as skirmishers and one sub-division in support. That of the second line was ten companies in columns of half-battalions (two company-columns alongside each other), and two companies and the two Engineer companies in single company columns. When the first line got to within 100 yards or so of the ravine, it was reinforced by the second line. The 3rd and 4th / 57th alone remained some 200 yards further South, lying down in close formation under the eye of Lieut.-Colonel Roell.[3] At the last moment of the attack, two companies were lying down in close formation and four were in deployed close lines. These fired several volleys, and afterwards advanced to the attack. They were met at some 20 or 30 yards by the advancing French masses (skirmishers and columns mixed up in one line)."

"The formations used by the Brigade were consequently many and various—swarms of skirmishers and closed sub-divisions, company-columns and half-battalions in column and line, and all this on a battle-field of uniform character. Now, this was a tactical blunder from the very moment that contour 780 was crossed. After this skirmishers only should have been used, but our knowledge of the power of the enemy's rifle was then very imperfect, and we had no faith or confidence in carrying out a fight with masses of skirmishers."

"The regiments of the Brigade fought alongside each other, and retired for some 1,500 yards or so under a murderous fire. According to the official account, they lost 72 officers and 2,542 men, out of a strength of 95 officers and 4,546 men, with which they went into action. The

[1] The official account gives the distance as 26¼ miles.

[2] General von Schwartzkoppen rode with the skirmishers up to the Mars-la-Tour—Vionville, road constantly exclaiming "Only skirmishers, gentlemen, please."

[3] Lieut.-Colonel von Roell had little faith in what he called *Hetzjagd*, literally, wild beast chase or disorderly movements, and he wished to keep these Companies in hand. Their losses, it is true, were small; but had they been where they are incorrectly shown to have been, according to the Regimental History of the 57th, in close formation, *i.e.*, in double company columns, their losses would, the author maintains, have been thrice what they were, or something like those of the 10th and 12th Companies of the same regiment.

strength given is right, but the losses are wrong (see losses at end of chapter)."

"The advance was not carried out by lying down and making alternate rushes. Three battalions (Fusilier Battalion 16th, 1st Battalion 57th, and Fusilier Battalion 57th) advanced at the increased pace, then so much in vogue, without making a pause of any kind, and only halted when compelled to do so by the enemy's fire and his counter-attack. Hence the exhaustion of our men when halted. Whether the 1st and 2nd Battalions 16th advanced by lying down and making alternate rushes I cannot say, for I could not see sufficiently well for myself; but I am rather inclined to believe it is one of those many yarns one so often hears about afterwards. The 57th lost very few prisoners, and these were nearly all rescued by the 1st Dragoon Guards. The 16th were not so lucky in this respect, for they left some 300 prisoners in the hands of the enemy, mostly belonging to the 1st and 2nd Battalions, as the charge of the Dragoons had been able to do nothing for them. These wheeled to the left past the right wing of the 3rd Company 57th (the extreme limit of their charge to the Northward and Eastward), and retired past Mars-la-Tour to the rear."

"The material results gained by the attack were not commensurate with the losses entailed. Lieutenant von Streit of the 57th, who walked over the enemy's position on the following morning, assured me that not ten dead Frenchmen were to be seen on the North side of the ravine."

"The Brigade had nothing to eat the whole day."

A Retrospect.

The following is a condensed comparison of the author's between Koeniggraetz and Mars-la-Tour:—

"Of the two attacks that have been taken as examples, and the details of which have been so thoroughly investigated, the former can, from a modern tactical point of view, be dismissed as being of historical interest only. It would have been impossible under the conditions of modern small arms. The latter, however, is, even, to the present day, perhaps the only example whence we can, if we go about it the right way, deduce certain practical laws which should govern the tactics of the future. But to do this we must take the case and examine it, to a certain extent, so to speak, with the magnifying glass; for in spite of the difference between the general circumstances of both cases, the numbers engaged, armament and final results of the attacks, they nevertheless, possess certain points in common, and present certain situations which invite discussion of a most instructive kind."

"The objectives of the opponents were in the first place very dissimilar. The defence of the Wood of Britz can only be taken as meant to cover a retreat already begun. On the other hand, at Vionville (Mars-la-Tour) the French intended to hold their ground and repulse the German attacks. At Problus the opposing forces were much about the same strength, whereas at Vionville (Mars-la-Tour) the French were in far superior strength to the Germans."

"The armament of the Saxon and Austrian infantry was inferior to that of the Prussian. Their artillery, on the other hand, was as good, if not better than that of the Prussians. But at Vionville (Mars-la-Tour) the French firearm was infinitely superior, and their artillery decidedly inferior to that of the Germans."

"The attack on Problus—Bor succeeded, but that on the heights of Bruville ended in the most complete failure the German offensive tactics experienced in the whole campaign. The conditions were much the same at Koeniggraetz and Vionville as regards the *moral* of Saxons and French, their tactical efficiency, and the character of the ground fought over. The position in the Wood of Britz was artifically strengthened, it is true, but by this it was not made one whit stronger against attack than was the French position by the natural obstacle in its front—the ravine that has been so often alluded to. And, again, if we further take into consideration the wire fences near Mars-la-Tour, which were actually under the fire of the defenders, the French position was the stronger of the two."

"The attack of the 14th Division on Problus—Bor and that of the 19th Half-Division on the Bruville heights were notably dissimilar as regards preliminary measures, advance to the scene of the conflict, position of the troops before making the actual attack, and a clear intimation of the objective. But as regards the handling of large forces in action they are both instructive, seeing what actually happened in one case, and what might have happened in the other. Determination to lead was in both cases the same, but skill in leading was otherwise."

Hoenig is not at all inclined to admit that the handling of the attacking forces at Mars-la-Tour was beset with greater difficulties than at Problus. It was more circumscribed, it is true, he points out, that is to say, it was more limited by topographical considerations. But, in his opinion, the case of Problus presented greater difficulties of execution. For in the latter case, he reminds us, both generals and troops were without war experience—in other words, knew nothing of practical tactics gained in the field; and his idea is that owing to this the whole business was conducted with the strict discipline and consciousness of a peace manœuvre only.

"At Mars-la-Tour," he says, "all the generals and most of the troops had seen war. Besides, there had been time during the interval of armed peace between 1866 and 1870 to fully understand the meaning of the warlike intentions of the French and study their mode of fighting. Their tactical system should have thus been perfectly well known to the Germans. Indeed it had been, as a matter of fact, the subject of many verbal and written instructions before the war broke out. But that the Germans little knew what they had to expect before collision actually occurred, and what was necessarily expected of their generals and officers, is a fact no longer open to dispute. German generals and officers must have perfectly well known that their men, once exposed on open bare ground, without cover of any kind, to the annihilating effect of the enemy's infantry fire, must necessarily pass from their control and get

out of hand. There being no doubt whatever on this point, no practical results could possibly be expected under such circumstances, officers exposing themselves to set matters right were merely shot down, and this occurred to those high in command. Thus the result of it all was that troops forming a large force were often left without leaders, without cohesion, physically and morally broken down, in fact, a wreck of what they had been, and quite incapable for the time of any further effort."

"It is quite another matter," he goes on to say, "dealing in the abstract with the performances of individual bodies of troops. Frontal attacks on a well-handled enemy have only a chance of success when a superiority of fire has first of all been established. Out-flanking attacks are more than ever what must be relied on, and the action of the Army of the Elbe on the 3rd July, 1866, may be well taken as an example of the kind. Its advance to the scene of the conflict was anything but perfect, and the statement made in the official account that it had to file through a narrow street (Nechanitz) is notoriously wrong. It was delayed, we know, for more than two hours, but after this it must be admitted it was lead and handled with consummate skill. The initiative of the subordinate leaders never outstripped the limits of responsibility of the Brigade command, and once a success was gained, steps were immediately taken to secure and keep it before it was followed up. Many cases of the kind might be quoted, but unity of command and consequent co-operation was never for a moment lost."

"Now we might take what we have described," he points out, "as the very ideal of *Auftragsverfahren*, still we have a shrewd suspicion that under modern conditions it would have been subject to very great modifications. The progressive, systematic and deliberative action of the Prussians were crowned, it is true, with complete success, for there is no doubt whatever that the whole of the 28th Brigade after occupying the Wood of Britz could have pushed forward on Briza and Rosnitz, had the 16th Division, instead of making a long detour and marching itself to a standstill, followed the 14th Division in the shortest direction by Problus and Rosnitz, and had the 15th Division done the same, which was also perfectly feasible. Had this been done, the battle would have ended in a complete catastrophe for the Austrian Army. One reason why this did not take place is that General von Herwarth neglected to throw bridges over the river in proper time. But even as things actually happened, the three Divisions of the Army of the Elbe would have reached the line of retreat of the Austrians quite soon enough had the general commanding the 16th Division only made up his mind to advance resolutely in the direction of Problus. Had he done this, he would certainly have been supported by the other Prussian forces that were there or thereabouts, and they would have been morally and tactically equal to the occasion. This was fully recognised in the 14th Division. The case of General von Etzel was, in fact, on this occasion much the same as was that of General von Kraatz afterwards at Vionville. And if we are to critically examine the whole circumstances of the case taken together, we must bring to light the causes that were at work regardless of persons, otherwise our researches in military

history lead to nothing in the way of instructive or useful lessons. Besides, the whole of the cavalry should have been concentrated at 4 p.m. at Charbusitz—a step which could just as easily have been carried out. The Prussians were opposed to an enemy as yet undefeated in a general engagement, and whose good fighting qualities they fully recognised; their cautious tactics were, therefore, perfectly justifiable, and this required the immediate presence of those high in command at points of special importance. Looking at it, then, in this light again the attack of the 14th Division cannot be considered otherwise than perfect of its kind."

"Modern military history has shown how easily an engagement can degenerate into the fight of numerous companies and even smaller units which, led by the brave, rather than intelligent, initiative of their officers, have a tendency to push forward. We Germans have rarely, and even then only very partially, experienced the defective side of this class of disconnected fighting. Still, it undoubtedly produces a disquieting sensation as to what would happen did this kind of fighting meet with a decided reverse. The battles at Vionville on the 16th August, and at Loigny on the 2nd December, 1870, might possibly have cleared up all doubts on the subject had not the French shown such an extraordinary want of energy and initiative."

THE PRUSSIAN TACTICS AT PROBLUS—BOR ON THE 3rd JULY, 1866.

We give the following remarks of the author under this heading *in extenso*:—

"On the 3rd July, 1866, an entire Division is to be seen manœuvring on a battle-field of a difficult character and never getting once from beginning to end of the action out of hand of its commander. Everything was done in an orderly manner, and if any irregularity was allowed it was soon afterwards corrected. In the attack itself long lines of skirmishers, with small closed bodies in support at intervals, were used alternately with battalions in columns of double companies (Fusilier Battalion 57th, 1st and 2nd Battalions 17th). One battalion (Fusilier Battalion 56th) in attacking the salient of the enemy's position suffered losses that might be compared to those experienced when fighting against the French Imperial Army armed with the Chassepot; but, in spite of the loss of most of its officers, it carried the village in the face of a determined resistance. Directly the place was captured, steps were taken for its defence. Divisional and Brigadier-Generals were everywhere to be seen in the foremost fighting line issuing their own orders themselves and leading the troops on. Battalions that had been extended were reassembled in a remarkably short space of time, and every kind of cover taken advantage of to avoid unnecessary losses. Thus an entire Division was invariable during every stage of a difficult attack absolutely in the hands of one man, and he always knew where the tactical units (battalions) were."

The author thinks it was the very ideal of an attack on a large scale properly carried out, so perfect, indeed, that no performance of the kind that has ever taken place can be compared to it. He goes on to say:—

"If no officer ever let the men under him get out of hand, the principle which comes next in tactics was no less strictly observed, that is to say, the troops were kept on the move as far as was possible and only allowed to engage in a musketry fight when there appeared to be every chance of success. The 14th Division could not have accomplished what it did, had not the time and circumstances of the situation immediately preceding the fight been fully turned to account."

"The first conditions of a tactical success are: a clearly-defined objective, a correct direction, the assembly of the principal units (Brigades) with deliberation and out of fire, and then, after advancing into proper position, the attack set in motion with uniform determination. Preliminaries of the kind are by no means a factor to be neglected in the success that may be expected. They were notoriously lost sight of in the case of the attack of the 38th Brigade on the 16th August, 1870; and as modern improvements in firearms have greatly added to the difficulties of bringing troops to the spot, forming them up, and launching them to the attack, the importance of such preliminary measures must all the more be insisted on."

"Generals and the General Staff were engaged on the forenoon of the 3rd July, 1866, in reconnoitring the battle-field, and it must be admitted they had more time to do this on that occasion than on the 16th August, 1870. Once the various tactical bodies were set in motion, that most powerful factor in all tactics—human nature—was never for a moment lost sight of. Troops were marched, not to within reach of the enemy's rifles, but well beyond it, without being allowed to get out of hand. Thus the first pause made by the 28th Brigade in its attack was some 270 yards or so from the *abattis*. But two Saxon battalions had already been defeated on the high ground South of Problus, and their killed and wounded lying in ranks on the ground, bore a grim testimony to the murderous effect of the needle gun. The heights of Problus commanded the whole of the ground over which the 28th had to cross, and there was a free field for fire without cover of any kind in front of the Britz Wood for some 330 yards."

How the Prussians managed to advance so far without a pause is explained by the author by the inferior armament of their opponents' infantry, their own tactical formations, the inequality of the enemy's resistance at different points, and the cohesion, rapidity, and energy with which the Prussian infantry were handled. In the attack on the wood, he points out, the Fusilier Battalion 57th met with hardly any resistance at one point, whereas at another the 1st Battalion 57th and 1st and 2nd Battalions 17th were stoutly opposed.

(To be continued.)

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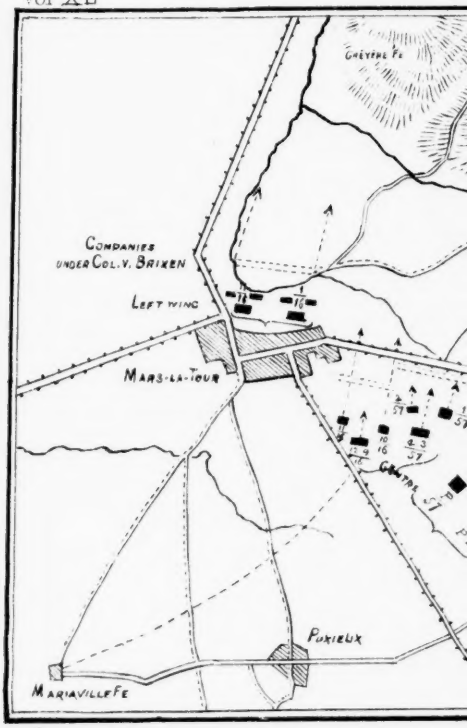

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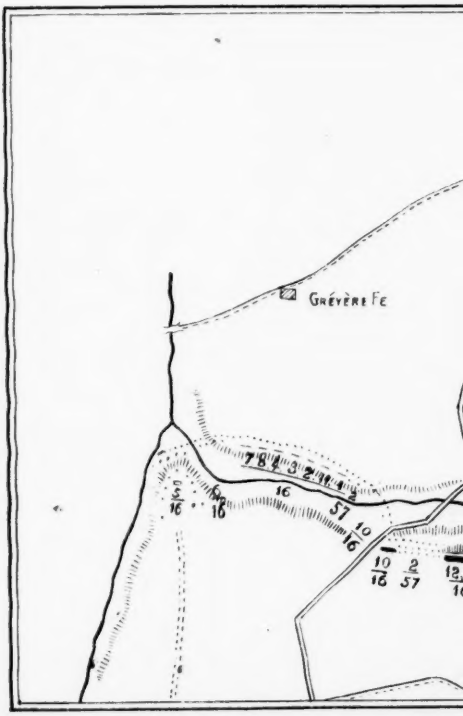

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THE 38th BRIGADE

its defiling past General von Schwartzkoppen,
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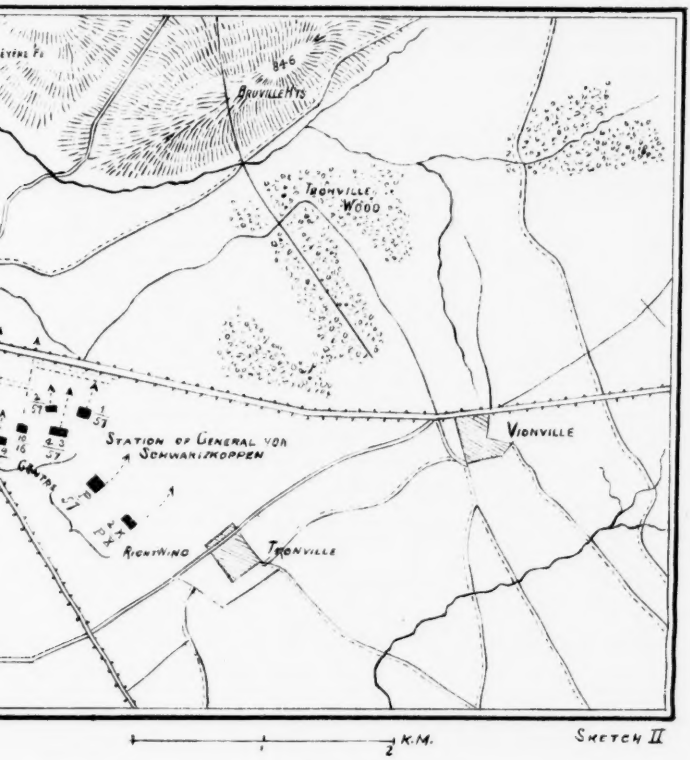
Plate 8



of the Attack of the 38th Infantry Brigade,
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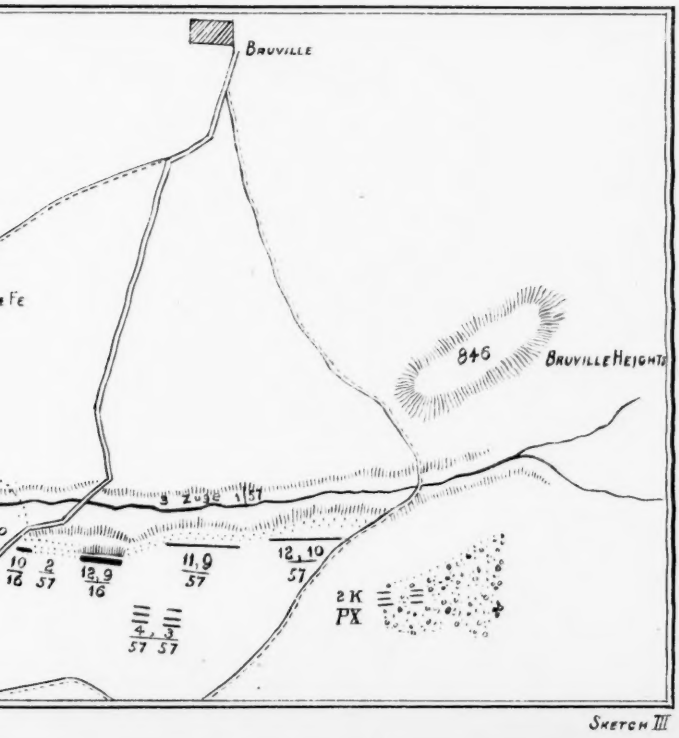


NAVAL AND MILITARY NOTES.

NAVAL.

HOME.—The following are the principal appointments which have been made: Rear-Admiral—R. H. Harris to be Second-in-Command of the Mediterranean Squadron. Captains—J. E. Blaxland to "Penelope" for command of Ascension Island; R. C. Prothero to "Trafalgar"; G. A. Gifford to "Fox." Commander—C. J. Baker to "Sphinx."

The first-class armoured-cruiser "Impérieuse" was commissioned at Portsmouth on the 5th ult. to relieve the "Royal Arthur," as flag-ship in the Pacific; although not as fast a ship as the "Royal Arthur," she is in every way a more powerful ship; she has since left for her station. The third-class cruiser "Canada" has arrived at Portsmouth to pay off, having been relieved in the West Indies by the "Pallas." The first-class battle-ship "Collingwood" is to pay off and re-commission at Malta, her new crew being taken out in the first-class cruiser "Grafton," which will bring the old crew home. The second-class cruiser "Mercury," lately from China, has paid off at Portsmouth; during a recent natural-draught trial before leaving China, the ship averaged over 16 knots for twenty hours, and was only then obliged to ease down consequent on the ship running into a fog; on a forced-draught trial the ship lately averaged over 18 knots. The third-class cruisers "Hyacinth," from the Pacific, and the "Caroline," from China, have arrived in England, and been paid off at Devonport and Sheerness respectively. The new second-class cruiser "Fox" is to commission to relieve the "Swallow" on the Cape Station; as the "Swallow" is only a sloop, and the "Fox" is one of the large second-class cruisers, the Naval Force on the station is materially strengthened by the change. The "Nymphe" and "Beagle" sloops have arrived at Portsmouth from the Pacific and South-East Coast of America respectively, and will pay off at that port. The second-class cruiser "Sappho" has arrived at Plymouth with the relieved crew of the third-class cruiser "Phœbe" from the Cape, and is to leave again with new crews for the "Sphinx" and "Redbreast," which are to pay off and re-commission at Bombay.

The new second-class cruiser "Doris" was launched at Barrow on the 5th ult. from the yard of the Naval Armament and Shipbuilding Company. Her dimensions are as follows:—Length, 350 feet; beam, 53 feet; and, with a displacement of 5,600 tons, a mean draught of 20 feet 6 inches. Her engines are to develop 9,600-I.H.P., to give a speed of 19·5 knots. Her hull is constructed entirely of steel, with the exception of the stem, and she is sheathed with teak and coppered. Protection is afforded by a strongly-built steel deck extending the whole length of the vessel, her engines and boilers, magazines, etc., being further protected by an inclined Harvey-armoured breastwork. Bunker accommodation is provided for 1,000 tons of coal, reserved coal being stowed in water-tight bunkers above the protective deck and extending over the engine and boiler space. A Harvey-armoured conning-tower is placed forward and a director tower aft, and bridges are fitted on the top of each for navigating purposes, the three search lights of the ship being worked from these bridges. The vessel is fitted with the usual auxiliary machinery for working feed and bilge pumps, turning and steering gear, fans, dynamos, distilling plant, etc., and she is lighted throughout by electricity. Her armament will consist of five 6-inch, six 4·7-inch, nine 12-pounder, and seven 3-pounder Q.F. guns, together with four

·45-inch Maxim machine-guns. The military tops to her two masts, which are of steel, will also be armed with machine-guns, and there will be two submerged torpedo-tubes forward and one above water aft. Accommodation for a complement of 450 officers and men is provided. An attempt to launch the "Dido," a sister-ship, at Glasgow, from the works of the London and Glasgow Shipbuilding Company on the 17th ult. was unsuccessful, but she was floated safely on the 20th.

The new first-class battle-ship "Renown" was taken into the Channel on the 27th ult. for the first of her series of official speed trials. The trial was of eight hours' duration, with natural draught, and throughout the engines and boilers worked satisfactorily. The mean results were:—Steam 143 lbs.; vacuum, starboard 26·9 inches, port 26·9 inches; revolutions, starboard 97·5, port 98·2; I.H.P., starboard 5,233, port 5,475—total 10,708; speed 17·9 knots. Messrs. Maudslay, Sons, and Field, the makers of the machinery, were responsible for an I.H.P. of 10,000 only on the natural-draught trial, but more than once during the trial the engines easily attained 11,000-I.H.P., while the mean was 708 in excess of the stipulated power. The mean speed was exactly 1 knot more than her designers anticipated that the vessel could attain on her natural-draught trial, and two-tenths of a knot more than it was estimated she would steam under forced draught with 12,000-I.H.P. Before she passes into the Reserve she is to carry out a thirty hours' full-power trial in the Channel.

The second-class cruiser "Phaeton" has been successfully undergoing a series of trials off Plymouth. The four hours' full-power trial was very satisfactory, as it proved the vessel to be capable of attaining a greater speed than was recorded of her in April, 1886, when she was first completed for sea. On that occasion, with a 5,000-I.H.P., she attained a speed of 16·6 knots; whilst on her recent trial the records gave her a speed of 17 knots, with only 4,755-I.H.P. The mean results for the four hours were:—Steam, 83 lbs.; vacuum, starboard, 26·3 inches; port, 27·6 inches; revolutions, starboard, 93·1; port, 93·4; I.H.P., starboard, 2,318; port, 2,437; air pressure, nil; speed, 17 knots. What makes these results especially gratifying is the fact that the "Phaeton" has served over seven years on foreign service. Her present refit, which was completed by the 31st ult. at a cost of £32,000, is the first the vessel has undergone, and even now very little has been done to her machinery department, as, of the total cost of her refit, £22,600 has been spent on her hull and fittings, and £4,050 on her armament.

For some time past three torpedo-boat destroyers have been utilised at Chatham for instructional purposes, but now the Admiralty have issued orders for the number to be increased by seven. As the vessels are received from the contractors they will be set apart for this purpose.

The torpedo-boat destroyers "Surly" and "Havock," having had serious defects repaired, had a trial of their machinery at Portsmouth yesterday, when neither vessel came up to the 4,000-H.P. and 27 knots speed as specified for. The I.H.P. of the "Surly" was 3,281 and speed 22·2 knots, with a mean air pressure of 2½ inches. The "Havock's" I.H.P. was 2,226, and speed 22·3 knots, with a mean air pressure of 2 inches. It is understood that both vessels will again have to go through their trials.

On February, 15th, the new third-class twin-screw cruiser "Pelorus" was successfully launched from Sheerness dockyard. The "Pelorus" is the first of a new type of third-class protected fast cruisers, several of which are to be built for the Navy. She is 300 feet long, 36 feet 6 inches beam, and will have a loaded displacement of 2,135 tons, at which her mean draught will be about 12 feet 6 inches. The hull of the vessel is constructed of steel, and her vital parts are protected by a turtle-back deck, throughout her length, of steel plating 2 inches thick, the stern and rudder posts, shaft brackets, etc., being of cast steel. The rudder is of the balanced type, and is worked by steam-steering gear. The vessel has a poop and forecastle, and between them the waist extends to about half her length, the officers' quarters being aft under

the poop and the crew being berthed forward. The propelling machinery of the ship, which is to be supplied and fitted by Messrs. J. and G. Thomson, of Clydebank, will consist of two independent sets of inverted three-cylinder triple-expansion engines, to be supplied with steam by eight water-tube boilers of the Normand type, and designed to develop 7,000-I.H.P. under forced draught, and to drive the ship at a maximum speed of 20 knots. Of the coal to be carried, which will be sufficient to give the vessel a radius of action, at 10 knots, of about 7,000 miles, part is to be stowed above the protective deck and over the engine and boiler rooms, while the remainder will be in side bunkers below that deck. The armament of the "Pelorus" will consist entirely of Q.F. guns, of which there will be eight 4-inch, eight 3-pounder, and three Maxim guns, two of the 4-inch guns being mounted on either side of the conning-tower on the forecastle and two on the poop, the remaining guns being distributed on the upper deck and at the bow and stern. The vessel is also fitted with two torpedo-tubes. The vessel is lighted throughout by electricity, the current being supplied by two dynamos. The keel plate of the "Pelorus" was laid on May 21st last, and the ship is to be completed in the coming June.

The "Desperate," the first of six of the new class of torpedo-boat destroyers ordered from Messrs. John I. Thornycroft and Co., was successfully launched at the end of February from their yard at Chiswick. The new destroyer is in general design similar to the "Daring," built by the same firm, but, having to attain the speed of 30 knots, she is larger and is provided with greater engine power. Her length is 210 feet; beam, 19 feet 6 inches; and depth, 13 feet 6 inches. To keep down the weight of the hull a new special make of steel has been used in it, which has a greater tensile strength of some 10 tons to the square inch than the mild steel generally used. The propelling machinery of the new vessel is of the "Daring" type and arrangement, but is designed to indicate 5,400-I.H.P., or 1,000 more than that of the "Daring." The boilers are of the Thornycroft water-tube type, three in number, the two forward ones being placed back to back with one funnel in common, and the after one with a funnel to itself. An improvement has been made by utilising the space between the funnels and their casings as upcast shafts for the purpose of ventilation. A modification has been made in the bow and stern of the "Desperate" consequent on the high speed she is intended to attain, the bow having more flare and the stern being made to rake forward, instead of aft, above water, thereby rendering her a much drier vessel than would otherwise be the case. The armament is to be six Q.F. guns—four on the broadsides, one forward, and one aft—and two torpedo-tubes. The "Desperate" was launched with all her machinery, boilers, etc., on board, and is practically ready for steaming, so that she should soon make her trials.

The new sloop "Algerine," has completed her official trials in the Channel. Both the eight hours' natural-draught and the four hours' forced-draught trials were highly satisfactory, the registered speed in each case being exceeded. The engines also slightly exceeded the guaranteed I.H.P. The trials were carried out without once exceeding an inch of air pressure, whereas the "Phœnix," a sister-vessel, recorded an average air pressure of 1·14 inch during her eight hours' trial. As this result points to economical steaming at a high power, it is considered probable that the "Algerine" will be selected to represent her type in carrying out a series of coal-consumption trials. The following are the mean results of her trials:—Natural draught—steam 150 lbs.; vacuum, starboard 27·6 inches, port 27·5 inches; revolutions, starboard 186·7, port 197·7; I.H.P., starboard 618, port 588—total 1,206; air pressure ·38 inch; speed, 12·7 knots. Forced draught—steam, 150 lbs.; vacuum, starboard 27·1 inches, port 27·4 inches; revolutions, starboard 209·2, port 197; I.H.P., starboard 731, port 759—total 1,490; air pressure, ·8 inch; speed, 13·1 knots. Both the "Algerine" and the "Phœnix" are intended for service on the China Station, where they will be employed as station gun-boats.

The results of the recent three hours' full-power trial of the torpedo-boat destroyer "Opossum," built by Messrs. Hawthorn, Leslie, and Co., were as follows: The mean speed of six runs over the measured mile on the Maplin was 28·242 knots, and the mean speed obtained in steaming for three consecutive hours was 27·131 knots. The fastest run was accomplished in 1 minute 55·4 seconds, which is equivalent to nearly 36 miles per hour; whilst the slowest run, against wind and tide, occupied 2 minutes 20 seconds, or a rate of 29·6 miles per hour. After running some miles at top speed, the engines were eased down, as it was evident the maximum speed required by the contract, 27 knots, was well within the "Opossum's" power. The mean steam pressure in the boilers was 192 lbs. per square inch, and the average I.H.P. developed by the engines was 3,895. The mean revolutions were—starboard engine, 341·6; port engine, 344·3 per minute.

Two interesting trials were lately made by Messrs. Laird Brothers, of Birkenhead, on board the "Lynx," torpedo-boat destroyer, at Devonport, for the purpose of thoroughly testing their new patent apparatus for automatically regulating the supply of feed water to the boilers. The gear was fitted to two of the boilers, and it was found that in rough weather, at full power and under all conditions of steaming, the water-level was well maintained in the boilers. The necessity for some such means of regulating the feed supply in dealing with water-tube boilers has been established, and Messrs. Laird have apparently solved the problem with the new gear. It will be remembered that the "Lynx" was the second of the 27-knot torpedo-boat destroyers designed and built by Messrs. Laird with Normand water-tube boilers, and was delivered to the Admiralty in December, 1894, since which time she and her sister-vessel, the "Ferret," have been continually at work.

The official trials of the torpedo-boat destroyer "Porcupine," built by the Palmer Shipbuilding Company, Jarrow-on-Tyne, were continued at Sheerness recently. The mean speed for six runs on the measured mile off the Maplin Sands was 27·989 knots, and for three hours' continuous steaming 27·915 knots, with a boiler pressure of 197 lbs. per square inch and an air pressure in the stokeholds of 2·2 inches. The engines developed 3,859-I.H.P., and the mean revolutions were 360 per minute. The machinery worked smoothly, and the speed, although nearly a knot in excess of the contract, was easily maintained.

The "Spanker," torpedo-gunboat, recently fitted at Devonport with Du Temple water-tube boilers, is to undergo a prolonged series of trials. She has already completed four hours' full-power steaming with forced draught. A mean I.H.P of 3,700 was recorded, with a speed of over 19 knots.

The new automatic feed-regulating apparatus recently fitted to the boilers of the torpedo-gunboat "Halcyon," in the Channel Squadron, has proved so successful as a labour-saving agency, that the Admiralty have given Messrs. Thornycroft and Co., the patentees, an order to manufacture sufficient of the new gear to fit out the boilers of the gun-boats "Dryad," "Gleaner," and "Hebe," on the Mediterranean station; the "Antelope," "Harrier," Hazard," and "Hussar," at Devonport; the "Leda" at Portsmouth; the "Circe" at Chatham; and the "Alarm" at Sheerness. The gear is also to be fitted to several of the torpedo-boat destroyers, and the "Lynx" and "Ferret" have been selected for this purpose from the Devonport flotilla. A peculiar point in connection with this automatic feed is that, although it was designed solely for use with water-tube boilers, it has been found to work equally well in connection with boilers of the locomotive type; in fact, all the vessels named, with the exception of the "Lynx" and "Ferret," are fitted with locomotive boilers.

The manufacture of water-tube boilers, which has hitherto been confined to private engineering firms, has now been extended to a Government establishment, Keyham factory having in course of construction a complete set of water-tube boilers, together with the propelling and auxiliary engines for the cruiser "Proserpine," on the building slip at Sheerness. Although the principle of a

water-tube is totally different from that of the locomotive and earlier types of marine boilers, the boiler-making department at Keyham have experienced no difficulty in making rapid progress during the short time they have had the new boilers in hand. The type of boiler selected for the "Proserpine" is that known as the Thornycroft, and, although up to the present the patentees have built their boilers for nothing beyond a 5,000-I.H.P., the Keyham staff have decided that those they have in hand shall develop an I.H.P. of 7,000. The "Proserpine's" boilers are being built throughout with steel tubes, it having been found by experience that copper, which has hitherto been employed for the construction of the tubes of this type of boiler, soon deteriorated under conditions to which a high temperature, due to high and rapidly-raised pressure, subjects them. It is stated on good authority that the Admiralty are making arrangements for introducing a special type of water-tube boiler, sufficiently distinct from existing types to prevent any possibility of infringing patentees' rights. This might have been expected, as there are dozens of different types of water-tube boilers in the market, and it is doubtful if any one engineering firm has had the same facilities for gaining a varied experience with water-tube boilers as have been afforded the Admiralty engineer experts and naval engineers during the past two years at Keyham, where the "Sharpshooter" fitted with the Belleville type, the "Spanker" with the Du Temple, and eight torpedo-boat destroyers, having a variety of types, have been subjected to examination and alterations. Considering the large sums of money which have been paid during the past two years on royalties for the right to manufacture water-tube boilers, the Admiralty are to be commended for deciding to take a step which will relieve the country of further expense in that direction.

Some important experiments have been lately made at Messrs. Yarrow's works, Poplar, when the results arrived at touching the circulation of the water in water-tube boilers were made known to the general public—that is, to such of them as were favoured with an invitation to be present; although, of course, it is to the engineer that these experiments are mainly interesting. With a view to throw light on the circulation of water in water-tube boilers, Messrs. Yarrow and Co. have for a long time been carrying out a series of trials, and, considering that the results obtained would at the present moment be of interest, especially to engineers, they determined to make them public. The most important point that these experiments prove is that the heating of down tubes actually accelerates the circulation and does not retard it, as is generally believed. The experiments actually carried out were nine in number. Experiment 1 clearly proved that the circulation gradually increased as more and more heat was applied, provided in this case by Bunsen lamps, irrespective of the proportion of the total heat absorbed by the up and by the down tube. Further experiments showed that, within certain limits, the rapidity of the circulation depended solely upon the total amount of heat supplied, irrespective of how this heat was divided between the ascending and descending columns.

In experiment 2, in the down tube is placed a small screw propeller, which when revolving actuates a vertical spindle, having at its upper end a worm. This arrangement was made at the suggestion of Mr. Maxim, and it enables the speed of the current under varying conditions to be estimated. Thus, when two lamps were acting on the up tube, the speed recorded by the propeller was found to be 28 feet per minute. This was the maximum. When the three lamps were acting on the up tube and three on the down tube, the speed was 55 per minute; and this was the maximum. These experiments proved that a gradual increase of speed in the circulating system occurred as more and more heat was applied, no matter whether this heat was absorbed by the water in the up or down tube. It should be remembered that, owing to the resistance offered to the flow of water by the screw, the actual speeds, if no screw had been there, would have been greater than those above recorded. It must be borne in mind that in all the fore-

going experiments circulation must have been set up by heat being first applied to the up current, which in all water-tube boilers is the case, those tubes nearest the fire being heated first, and thus circulation is established.

Experiment 4 consisted of a cistern from the bottom of which were led three tubes, the lower portions of which were of copper, the upper portions of glass. The three copper tubes were united at their lower extremities, being secured in a horizontal chamber. They were all situated in a gas furnace, lined with asbestos, heat being applied directly to the tube on the one side by means of several multiple Bunsen burners. This experiment more nearly approaches the conditions of an ordinary Yarrow water-tube boiler, and it was seen that sometimes there were two down currents in the tube cooler tubes and one up current in the tube most heated, and at other times there were two up tubes and one down tube. In this model as much as 9 lbs. of water per square foot of heating surface was evaporated.

Space will not suffice us to describe all the experiments carried out, though all were exceedingly interesting, but experiment 7, unlike its predecessors, was conducted under a pressure of 150 lbs. per square inch. At the upper part of the model was a steam chest, to the bottom of which was attached a U tube, fitted with glass at its upper extremities to render the circulation visible. There were three small Bunsen lamps in connection with one leg, and five large ones with the other. It was found that if by lighting the three lamps on one side circulation was once established, producing an up current on that side, then the five large flames on the down current might be started, increasing the circulation, which actually continued after the three flames in the up tube were all turned out. This extreme condition under which circulation can be maintained is one which few engineers would believe possible, and confirms the views expressed by Professor Lambert and Mr. Maxim. This experiment conclusively proved that circulation was more efficiently maintained at a high than at a low pressure. Also that, so long as there is a good circulation, no possible objection can exist to the adoption of straight tubes, as in the Yarrow boiler, owing to any imagined necessity to allow for variation in length due to difference of temperature. It may be added that the maximum evaporation obtained by Messrs. Yarrow and Co., when the circulation has been forced to a very high pitch, was 25 lbs. of water per square foot of heating surface; but this being an uneconomical amount of forcing, is far beyond the range of what is desirable in practice.—*Naval and Military Record* and *Times*.

ARGENTINE REPUBLIC.—We are indebted to the courtesy of the firm of Sir W. Armstrong, Mitchell and Co. for the photograph of the new cruiser "Buenos-Aires," which they have lately completed at the Elswick Shipyard for the Argentine Government, as also for the accompanying description of the ship and her trials. This vessel is the third cruiser of exceptional speed which this firm has built for the Argentine Government during the last five years, the other two being the "25 de Mayo" and "9 de Julio."

The steam trial which took place on the 2nd November resulted in a performance which places the "Buenos-Aires" above all cruisers in point of speed, for on a six hours' run, with natural draught, the pressure in the stokeholds never exceeding a head of water of four-tenths of an inch, she obtained 23·202 knots an hour, the results being deduced from actual times taken on the measured mile course, over which six runs were made at the commencement of the trials. The recorded revolutions of the engines during these six runs were maintained, and even exceeded during a great part of the six hours' run, the above-named speed of nearly 23¼ knots being thus kept up during the whole time. The twin-screw engines, which are of the triple-expansion vertical type, were constructed by Messrs. Humphrys, Tennant and Co., of Deptford, and worked without any hitch whatever during the whole trial, the power maintained being close upon 14,000-I.H.P. It is not certain whether any forced-draught trials will be made before the vessel

departs for Argentina, but there is no doubt that the speed obtained with forced draught would be 24 knots; but all conversant with the subject will know that the natural-draught performance is one to which the greatest importance should be attached.

The principal dimensions of the vessel are as follows:—Length between perpendiculars, 396 feet; extreme breadth, 47 feet 2 inches; and her mean draught on trial was 18 feet 3 inches, corresponding to a displacement of 4,740 tons, which represents the weight of the vessel complete for sea with her normal supply of coal, her armament, ammunition, stores, water, crew, etc. She is a flush-decked vessel, built entirely of steel, and sheathed with wood and copper; all her machinery, magazines, and steering gear are kept entirely below the curved steel-armour deck, varying in thickness from 1½ inches on the flat parts to 3 inches on the slopes at the side, and 5 inches over the engines. The coal bunkers are also situated on the sloping parts of this deck, and would add to the waterline protection as long as any coal was left, the full supply that can be carried being 1,000 tons. The armament of the "Buenos-Aires," which is a very powerful one, is entirely composed of Elswick Q.F. guns, ranging from the 8-inch gun with a 250-pound projectile, down to the small 1-pounders. She has two 8-inch guns, placed one forward and one aft, and each with 270° arc of training, four 6-inch guns, two able to fire right ahead, and two right astern, six 4·7-inch guns, training three on each broadside, sixteen 3-pounder guns situated on the shelter decks, hammock berthing, etc., and eight 1-pounder guns, four of which are placed in the military tops; she also has five above-water torpedo-discharges. All the Elswick guns are 45 calibres in length, and the gunnery trials were very successful. The two 8-inch guns are the most interesting in the ship, chiefly on account of their great length, their automatic mechanism for opening and closing the breech, and their electrical training gear. With a pressure of 14 tons they have a muzzle velocity of 2,650 foot-seconds, and with 16 tons pressure the muzzle velocity is 2,750 foot-seconds. The ordinary projectile for these guns weighs 210 lbs., this being considered a weight which can be handled with rapidity during loading. Projectiles of 250 lbs. have, however, been supplied to the ship to be used if required. Eight-inch guns are the largest that have yet been made on the Q.F. principle. They are fitted with a modified de Bange obturation, so that cartridge-cases are unnecessary, and the charge can be in two parts. The gun is controlled by hydraulic means recoiling in the line of fire; and although very rapid in its action the trials showed that no shocks were caused which would result in damage to the structure of the vessel. The 6-inch and 4·7-inch guns are mounted on the broadside, and have pedestal carriages of the latest Elswick pattern. They are protected by 4½-inch sloping shields. All of the guns can be fired either by electricity or percussion. For the former system there are two alternatives. The first, to be generally used, consists of a small independent dynamo providing current through a main cable which is kept under the armoured deck. Branches from this current feed each gun, and the current supplied can be used both for firing and illuminating night-sights. The arrangement differs from that usually followed, its chief advantages being that it requires much less attention than batteries do. This is especially the case in hot climates when batteries are apt to dry up. A primary battery is, however, provided in case the dynamo is not immediately available. Steam hoists are supplied for bringing the ammunition from the magazines below through armoured tubes. The muzzle velocity of the 6-inch gun, with a pressure of 14 tons and a shot of 100 lbs., is 2,570 foot-seconds; with the 4·7-inch gun the muzzle velocity, with the same pressure, is also 2,570 foot-seconds, the projectile in that case being 48 lbs. The usual procedure in gunnery trials was carried out, all the guns being fired with full charges at maximum elevation and depression, and also horizontally. The long programme was successfully carried out, and the "Buenos-Aires" returned to the Tyne. It

may be interesting to state that the armament of the "Esmeralda," a cruiser of 7,300 tons, now building at Elswick for the Chilian Government, will give an energy of 526,884 foot-tons per minute, or 72·2 foot-tons per ton displacement, as against the "Buenos-Aires" 304,844 foot-tons per minute, or 67·7 foot-tons per minute per ton displacement. For purposes of comparison it may be stated that the "Royal Sovereign" class have 20·7 foot-tons per minute per ton of displacement, and the "Magnificent" class—our latest battle-ships—26·4 tons. The latter, of course, are armour-clad vessels; but our heavy cruisers, the "Powerful" and "Terrible," of over 14,000 tons, will have only 21·6 foot-tons per minute to each ton of displacement.

AUSTRIA-HUNGARY.—The following ships are to be commissioned this month, and will form the Evolutionary Squadron:—

First-class armoured-cruiser—"Kaiserin und Königin Maria Theresia."
First-class protected-cruisers—"Kaiserin Elisabeth," "Kaiser Franz Joseph I."
Torpedo-avisos—"Spalato," "Trabant," "Planet," "Satellit," and "Blitz."
Torpedo-depôt-ship—"Pelikan," and nine torpedo-boats.

The squadron will be under the command of Vice-Admiral Freiherr von Spaun, with Rear-Admiral C. Seemann von Treuenwart as second in command.

Frigate-Captain J. Beck von Wellstädt has been appointed President of the Marine Section of the Ministry of War in succession to the late Rear-Admiral J. von Lehnert.—*Militär-Zeitung.*

FRANCE.—The following are the principal promotions and appointments which have been made: Capitaines de Frégate—T. A. Testard, C. A. Esmez, and L. A. Massenet to Capitaines de Vaisseau. Rear-Admiral—E. Pottier to Command of 2nd Division of Active Squadron of Mediterranean Fleet. Capitaines de Vaisseau—C. A. Esmez to "Bouvines"; J. Bellue to "Dévastation." Capitaines de Frégate—E. A. Pailhès to "Épervier"; C. H. Robin to Command of Défense-Mobile at Cherbourg.—*Le Moniteur de la Flotte.*

The new first-class battle-ship "Charles-Martel" commissioned at Brest on the 1st inst. with reduced complement to undergo her trials. She is a ship very similar in type and armament to the first-class battle-ships "Carnot" and "Jauréguiberry," which are also commencing their trials at Toulon. Fault is being found that in these ships there is no means of training or elevating the heavy guns by hand in the event of the hydraulic or electric gear breaking down. The "Jauréguiberry" has made her first preliminary trial off Toulon; with the engines developing 7,000-I.H.P., the engines making 80 to 82 revolutions, a mean speed of 16·5 knots was obtained. It is consequently hoped that on her forced-draught trial the contract speed of 18 knots will be realised.

Orders have been given to stop the construction of the small torpedo-boats which the "Foudre," built as a torpedo-depôt-ship, was to have carried, as she is now to be converted into a cruiser; the two torpedo-boats already built for her are to be utilised for protection of the coast fisheries. The first-class battle-ship "Formidable," having been relieved by the "Brennus" as flag-ship of the Commander-in-Chief of the Active Mediterranean Squadron, has been placed in the second category of the Reserve at Toulon. The new torpedo-aviso "Casabianca" has made a four hours' full-speed trial at Rochefort, averaging 21·2 knots, being nearly a knot, however, below the contract speed, which is 22 knots; at a further trial, with the engines developing 2,000-I.H.P. out of a possible 5,000-H.P., the speed obtained was 16 knots. The new torpedo-aviso "Cassini" has also resumed her trials after repairs, and on a four hours' full-speed trial averaged 22 knots. The new first-class armoured-cruiser "Bruix" is to commission at Rochefort with reduced complement for trials on the 15th inst.;

and the new second-class cruiser "Descartes," commissioned on the 1st inst. at Brest for the same purpose. After the completion of her trials, the "Descartes" is to relieve the old wooden third-class cruiser "Forfait" in China, thus materially increasing the strength of the squadron.

The Squadron of the North will complete to full crews on the 1st June for four months, and the Reserve Squadron of the Mediterranean Fleet will complete to their full effective strength on the 1st July for one month.

The new second-class cruiser "D'Assas," a sister-ship of the "Cassard" and "Duchayla," was launched, on the 28th ult., at Saint Nazaire, where she has been built by the Société de la Loire from the designs of M. Lhomme. The contract was signed in November, 1893, and the cruiser is to be completed in February, 1897. Her dimensions are as follows:—Length, 325 feet 8 inches; beam, 44 feet 10 inches; and, with a displacement of 3,952 tons, an extreme draught of 20 feet 5 inches. The protection consists of a steel deck, having a maximum thickness of 2·3 inches, and hardened steel shields to the guns. She will carry six 6·4-inch, four 3·9-inch, ten 1·8-inch, and eleven 1·4-inch guns, all Q.F., with two above-water torpedo-tubes. Two sets of vertical triple-expansion engines, supplied by D'Allest boilers, are to develop 9,500-I.H.P., giving a speed of 19·25 knots. The coal capacity is 614 tons, sufficing for 6,000 miles at 10 knots and for 1,000 miles at full speed. The ship is to have a complement of 22 officers and 371 men.

The Minister of Marine has taken up seriously the question of submarine-boats, and has offered a series of prizes for the best designs for such a vessel. The displacement is not to exceed 200 tons, the surface speed is to be 12 knots, and the vessel must be able to go 100 miles at a speed of 8 knots, and also to maintain a speed of 8 knots under water for 10 miles. Two torpedoes ready for launching must also be carried. The designs will become the property of the Government. Full details and complete plans are to be sent in, which must also show the basis on which stability, form of the vessel, motive-power, etc., have been calculated. The first prize will be 10,000 francs.

The Minister has further decided that the dockyard at Cherbourg is to be put into a condition for building and completely repairing torpedo-boats, which work up to the present has been entirely carried out at private yards. As a beginning, it is provided in the Budget of 1897 that two first-class torpedo-boats shall be laid down at that yard.

According to the Budget for 1897, the Active Squadron of the Mediterranean Fleet will consist of the following ships:—

First-class battle-ships — "Brennus" (flag-ship of Commander-in-Chief), "Charles-Martel," "Courbet," "Dévastation" (flag-ship of Rear-Admiral Commanding 2nd or Levant Division), "Jauréguiberry," "Magenta," "Neptune" (flag-ship of Rear-Admiral Commanding 3rd Division), "Marceau," "Redoutable."

First-class armoured-cruisers—"Amiral-Charner," "Bruix."

Second-class cruiser—"Bugeaud."

Third-class cruisers—"Cosmao," "Galilée," "Linois," "Troude."

Torpedo-cruisers—"Faucon," "Vautour," "Wattignies."

Torpedo-aviso—"Lévrier," "D'Iberville," "Casabianca."

Torpilleurs-de-haute-mer—"Argonaute," "Éclair," "Flibustier," "Forban," "Kabyle," "Sarrazin."

At Constantinople the aviso "Pétrel" with its tender the "Étincelle."

All the ships will be in full commission for the whole twelve months, with the exception of the "Cosmao," which will be relieved during the last quarter of the year by the "Galilée." The squadron will therefore be composed of 6 first-class and 3 second-class battle-ships; 2 first-class armoured-cruisers; 1 second-class cruiser; 3 third-class cruisers; 3 torpedo-cruisers; 3 torpedo-avisos; 6 torpilleurs-de-haute-mer—making a total, exclusive of the "Pétrel," of 27 ships.

The Reserve Squadron of the Mediterranean will be composed as follows :—

Second-class battle-ships—"Amiral-Duperré" (flag-ship of Vice-Admiral Commanding), "Friedland" (flag-ship of Rear-Admiral second in command.)

Coast-defence battle-ships—"Caïman," "Terrible."

First-class armoured-cruiser—"Chanzy."

Second-class cruiser—"Foudre" (built as a depôt torpedo-ship).

Third-class cruisers—"Forbin," "Milan."

Torpedo-avisos—"Léger," "Bombe."

Torpilleurs-de-haute-mer—"Dragonne," "Téméraire";

making a total of 2 second-class and 2 coast-defence battle-ships; 1 first-class, 1 second-class, and 2 third-class cruisers; 2 torpedo-avisos and 2 torpilleurs-de-haute-mer; or 12 vessels in all, which will be in full commission for one month and on the footing of *effectif d'essais* for the remaining 11 months of the year.

The Squadron of the North will be composed as follows :—

First-class battle-ship—"Hoche" (flag-ship of Vice-Admiral Commanding).

Coast-defence battle-ships—"Bouvines" (flag-ship of Rear-Admiral second in command), "Amiral-Tréhouart," "Jemmapes," "Valmy."

First-class armoured-cruisers—"Dupuy de Lôme," "Latouche-Tréville," "Pothuau."

Second-class cruisers—"Chasseloup-Laubat," "Friant," "Duchayla."

Third-class cruiser—"Surcouf."

Torpedo-cruiser—"Fleurus."

Torpedo-avisos—"Lance," "Salve," "Cassini."

Torpilleurs-de-haute-mer—"Aquilon," "Lansquenet," "Mangini."

The squadron will be in full commission for four months, and on the footing of *effectif d'essais* for the remaining eight months of the year. Its normal strength is to be :—1 first-class battle-ship; 4 coast-defence battle-ships; 3 first-class armoured-cruisers; 1 second and 1 third-class cruisers; 1 torpedo-cruiser; 3 torpedo-avisos, and 3 torpilleurs-de-haute-mer—making a total of 17 ships.—*Le Moniteur de la Flotte, Le Temps*, and *Annexe No.* 6 *du Projet de Loi* (*Budget des Dépenses du Ministère de la Marine*).

ITALY.—The following are the principal appointments which have been made: Vice-Admiral—G. G. Frigerio to Command of the Second Military Department (Tarento). Rear-Admirals—F. Cobianchi for service at the Ministry of Marine; A. di Brochetti to be Naval Adjutant to H.M. the King. Captains—L. Vedovi to be Director-General of the Dockyard of the 3rd Maritime Department (Venice); A. Rebandi to be President of the Military Tribunal at Spezia.—*Gazzetta Officiale.*

The Navy has sustained a severe loss in the death of Vice-Admiral Carlo A. Racchia, who died on board his flag-ship the "Lepanto" off Spezia on the 12th ult., when in command of the Reserve Squadron. The deceased officer, who was one of the most skilful and trusted officers in the Navy, was in his sixty-fourth year; he was of Scottish extraction on the mother's side, and had been partly educated in England. His funeral was attended by Admiral H.R.H. the Duke of Genoa, and a large concourse of naval and military officers.

The new first-class armoured-cruiser "Carlo Alberto" was launched at Spezia on the 14th ult. She is a sister-ship of the "Vettor Pisani," which is in hand at Castellamare, and her dimensions are as follows :—Length, 325 feet; beam, 59 feet; and with a displacement of 6,500 tons she has a mean draught of 22 feet 11 inches. She has an end-to-end belt of nickel steel from the Terni works, 6 inches thick, and a battery above protected with plating of the same thickness, extending more than a third of the ship's length. The battery is closed in with 2-inch steel athwartships bulkheads, and is provided with steel splinter-screens between the guns, and there is an over-all armour-deck 1·4 inches thick. The ship

has a double bottom, cofferdams filled with cellulose, and numerous water-tight compartments. The armament consists of twelve 5·3-inch Q.F. guns, of which eight are in the battery (four on a side) and four on the superstructure above at the corners of the armoured casemate. On the superstructure also are six 4·7-inch Q.F. guns, two on each broadside, one forward and the other aft; and the smaller guns are ten of 2·2-inch, and eight of 1·4-inch, of which several are for the tops of the two fighting masts. The torpedo equipment consists of four broadside tubes and one in the bows. The machinery has been built by Messrs. Ansaldo. Two triple-expansion engines, developing together 13,000-H.P. with forced draught, are supplied by eight boilers distributed in four compartments, and are to give a speed of 20 knots. The maximum coal supply will be 1,000 tons, in addition to liquid fuel, and the complement of the ship will be 460 men.

It is proposed to lay down a 28-knot torpedo-boat destroyer of the "Daring" type; and two 24-knot sea-going torpedo-boats; two torpedo-cruisers of the improved "Caprera" type of 1,300 tons displacement, and 23 knots speed, and an armoured-cruiser of between 8,000 and 10,000 tons with a speed of not less than 22 knots. These vessels will be built at Castellamare, where it is also proposed to lengthen the building slips 3 and 4. It is, however, doubtful how soon a beginning will be made with these ships, as it is now stated that the two new torpedo-cruisers "Principe di Napoli," and "Regina Margherita," the construction of which was sanctioned in the last Budget, have not as yet been commenced, the money voted for them having been devoted instead to the campaign in Abyssinia. Progress, however, is to be made with the "Agordat" and "Coatit" torpedo-cruisers of 1,313 tons, and which are to have a speed of 23 knots.

The Budget for 1896-97 has been fixed at 87,133,689 lire, being an increase of 70,710 lire over the last.

It is reported that the Minister of Marine has sent a circular letter to all the Admirals, asking their opinion as to whether, in view of modern naval tactics, it is advisable to continue the building of battle-ships. It is said that the large majority of replies received are in favour of giving up battle-ships, and the building instead of a fleet of very fast and very powerfully-armed cruisers.—*Mittheilungen aus dem Gebiete des Seewesens* and *Il Corriere Toscano.*

UNITED STATES.—The six new light-draught composite gun-boats will be of two different types, one having full sail power, there being a spread of canvas of 11,165 square feet, and propelled, when steaming, by a single screw worked by a triple-expansion engine; the other carrying sail enough only to steady them in a seaway, and driven by twin screws, actuated each by its own engine of the triple-expansion type.

Their principal dimensions and general features are:—

	Single-screw Type.	Twin-screw Type.
Length on load water line	168 feet.	174 feet.
Beam extreme at load water line	36 ,,	34 ,,
Draught, normal to bottom of wooden keel	12 ,,	12 ,,
Displacement, normal	1000 tons.	1000 tons.
I.H.P.	800	800
Speed an hour, estimated	12 knots.	12 knots.
Coal supply, bunker capacity	238 tons.	250 tons.
Complement—officers, seamen, and marines	146	146

The armament, consisting entirely of Q.F. guns, will be composed of six 4-inch breech-loading rifles, with 900 rounds of ammunition; four 6-pounders, with 2,002 rounds of ammunition; two 1-pounders, with 1,200 rounds of ammunition.

Two of the 4-inch rifles will be carried, one at the bow and one at the stern; the other guns, excepting the 1-pounders on the hammock berthing, will be placed most advantageously on the gun-deck and well protected from musketry fire to which the river and shallow water service may expose them. The frames and all metal structural parts will be of steel, or of some other metal or approved alloy; the constructive time limit will be fifteen months from date of signing contract, and the limit cost, exclusive of armament, is fixed at $230,000 each.

The new torpedo-boats, with a displacement of 180 tons, will be 170 feet long between perpendiculars, with an extreme water line beam of 17 feet upon a mean, normal draught of 5 feet 6 inches. The hulls are models of the most recent practice; with an easy razor-like entrance and a long fine run below water toward the screws. The "tumble-home" which begins just forward of the midship section, increases aft, where it broadens out over the propellers, giving a very full water-line area of shallow draught. This flat form of stern prevents the settling so common to torpedo-boats under full power, while holding to the water in all conditions of weather, and preventing racing of the screws.

The boats will be built of steel. The armament will consist of three 18-inch torpedo-tubes on swivel mounts and of four 1-pounder Q.F. guns. Six hundred rounds of ammunition will be allowed for the guns, while four automobile torpedoes—the type yet undetermined—will be provided; the spare one being carried in a steel stowing case on the starboard beam. The torpedo-discharges will be arranged on the deck, two forward and one aft, the forward tubes being placed slightly on echelon, admitting of considerable athwartship fire in addition to the extended field of action of each on its own side. The after discharge will be on the centre line, and will have an unhampered sweep of 280°. This emplacement is devoid of "dead angles," and gives an all-round discharge of great scope.

The conning towers, of which there are two, will be near the bow and the stern, each about 35 feet from its respective end. Hand steering gear will supplement in the forward tower the steam mechanism common to both towers, affording one more chance in case of mechanical failure. The forward tower will be surmounted by one of the 1-pounder guns, to be worked from a gallery on the after-side. The three others will be mounted along the sides, two on the port and one on the starboard. The freeboard forward is carried up to a height of 12 feet 6 inches, adding materially to the sea-going qualities of the boats, while yielding increased berthing space for the crew and a housing for some of the forward mechanisms.

So important is speed in this type of craft that 50 per cent. of the total displacement will be absorbed by the boilers, engines, and appurtenances, and the magnitude of this amount may best be appreciated when it is known that this allowance is just double that for the motive mechanism of the commerce destroyers "Columbia" and "Minneapolis." The engines, which are of the triple-expansion type, each in its own water-tight compartment and actuating a separate screw, are very fine examples of power and compactness, beautifully balanced, with a very nice distribution and division of weights. With a common stroke of 18 inches, impelled by steam at a pressure of 250 lbs. to the square inch, supplied by three water-tube boilers that flank the engine space—two forward and one aft—the two 6-foot manganese bronze screws will be driven by the engines at the rate of 395 turns a minute, developing an I.H.P. of 3,200, and driving the boats through the water at a speed of 26 knots an hour. The normal coal supply will be 12 tons, with a total bunker capacity of 60. There will be no search-lights, but the boats will be lighted by electricity; and natural ventilation will be ample to ensure comfort under all conditions of service. Folding boats will be carried. No premiums are offered for increased speed, and, with the well-known governmental margin of safety, the penalties for decreased speed need not be

feared; while even a more excellent performance may reasonably be hoped for. One boat will be built by Moran Brothers Company, of Seattle, Washington, for $163,350, and the two others will be built by the Herreshoff Manufacturing Company, of Bristol, R.I., for $144,000 apiece.

The Inspection Board has spent several days on the new second-class battle-ship "Texas," which was only recently put into commission on completion, carefully investigating into the defects of the vessel herself, the machinery, guns, etc. They recommend quite a number of changes and improvements, among others that docking keels be fitted one on each side, such as are now provided for in all new battle-ships; that various bracket-plates be stiffened when a convenient opportunity occurs; that additional water-tight doors be fitted to facilitate communication between fire rooms and in passing coal from one side of the ship to the other. The feed pumps are not efficient. They also recommend various changes in the piping, so that any pump can supply any boiler. The packing in the joints of the hydraulic appliances having deteriorated, these leaked to such an extent that it was impossible to maintain the necessary pressure to work the 12-inch guns in the turrets. In the hydraulic pump room the leakage of steam from these joints created a heat that made it impossible for the men to remain. The Board suggests that the hydraulic appliances as they are, be put in proper condition, in order to fairly test their efficiency. Work is also necessary on the turrets, ammunition hoists, electric firing appliances, etc. The situation of the 12-inch magazines between the fire rooms is bad for storing powder, being too hot. The Board states that this defect can be readily remedied. The "Texas" will be sent to a navy yard, and all the defects pointed out will be taken in hand and remedied as soon as possible.

The new ram "Katahdin," the latest accession to the navy, had her official trial on October 31st, 1895, over the Long Island Sound course, completing 17 knots in one direction in 1 hour, 5 minutes, 32 seconds, and the return trip in 1 hour, 0 minute, 44 seconds. When corrected the results gave her unofficial speed as only 16·11 knots—far below the contract, although her engines showed about 200-H.P. over the contract requirements. This result of the trial trip threw the vessel back upon the builders' hands. Various pleas were entered in their defence, based on the new type of vessel, its real value even at the reduced speed, and a Bill providing for her acceptance was passed by Congress, and on January 9th, 1896, the formalities for her acceptance were concluded and the new ram will soon be in commission.

The "Katahdin" is a twin-screw armour-plated vessel, built from the designs of Rear-Admiral Daniel Ammen, and is based upon the personal experience of the Admiral in the use of and the defence against rams in the Civil War, 1861-65. The plans were made in the Bureau of Construction and Repair, under the supervision of Commodore T. D. Wilson, in consultation with Admiral Ammen, and the machinery was designed in the Bureau of Steam Engineering, under the supervision of its Chief, Commodore George W. Melville. The bids for her construction were opened at the Navy Department on December 20th, 1891. There was one bidder only, the Bath Ironworks, and on January 28th, 1891, the contract was awarded to this company to build and equip the vessel and machinery and to place the armour for $930,000, to be completed by July 28th, 1892.

On March, 27th, 1891, the Navy Department approved the proposition of the contractors to lengthen the vessel 8 feet, the corresponding increase in the displacement (133 tons) to be utilised in increasing the coal supply and providing a battery of four 6-pounder Q.F. guns for defence against torpedo-boat attack, the original design having no battery whatever. The type and size of the boilers were also modified. With these changes the dimensions of the vessel are as follows:—Length over all, 251 feet; length on the normal water-line, 250 feet 2 inches; extreme breadth, 43 feet 5 inches; breadth on water-line, 47 feet 6 inches. The total depth

from the base to the crown of deck amidships is 22 feet 10 inches, and the normal draught of water is 15 feet, the corresponding displacement being 2,155 tons. The lower portion of the hull is dish-shaped up to a sharp knuckle, which runs all around the vessel 6 inches below the normal water-line, the angle of the knuckle amidship being about 90°. Above this knuckle the shape of the hull is a circular arc, with a radius amidship of 39 feet, rising from 6 inches below to 6 feet above the normal water-line. This curved deck is armour-plated throughout, the thickness of the armour tapering from 6 inches at the knuckle to 2 inches at the crown of the deck. Above this deck is a conning tower of 18-inch armour, a funnel and ventilators, and two light barbettes, within which the guns will be mounted, and skid beams for carrying the boats. Longitudinally from the point of the ram to the stern the lower portion of the hull is shaped in a fair curve, but the upper portion is straight from the head of the stem to within about 30 feet from the stern, from which it rounds down to the knuckle. An armour belt, from 6 inches to 3 inches thick and 5 feet deep, extends below the knuckle. The hull is framed by continuous longitudinal girders, both below and about the knuckle, which, gathering together at the bow and stern, make a rigid structure. A continuous water-tight inner bottom 2 feet from the outer skin is carried nearly the whole length of the vessel and up to the armour-shelf on each side. The double bottom is divided and sub-divided by longitudinal and transverse frames, so that there are seventy-two water-tight compartments. The inner hull is further subdivided by water-tight bulkheads, both longitudinal and transverse. The ramhead is of cast steel, extending back 11 feet in a vertical line, and it is supported by longitudinal braces in such a way that the force of the blow delivered by it is designed to be distributed through the vessel. The maximum estimated speed, at full power, was 17 knots, and the impact of the ram at this speed is equivalent to the blow of a hammer weighing over 2,000 tons moving at this rate of speed—a blow which, if fairly delivered, would crash through the sides of any vessel afloat.

There are two engines, horizontal, direct-acting, triple-expansion, driving twin screws, the cylinders 25, 36, and 56 inches diameter respectively, and with 36 inches stroke, common, with 4,800-H.P. when making 150 revolutions per minute. The main steam valves are of the piston type, one for each high and intermediate and two for each low-pressure cylinder, driven by Marshall radial gear, with compensating rock shafts, and all the valve gear except the rock shafts being interchangeable. The engine keelsons are built in the ship and the cylinders cast with brackets attached to be bolted together and to the keelsons. The cylinders are also attached by forged steel tie rods to the bed plates and engine frames. There is one forged steel piston rod for each engine, with a crosshead working on a cast-iron bar guide, the valve stems being of forged steel. The crank shafts are in two sections for each engine, of mild forged steel, 10¼ inches in diameter in the journals and 11 inches in the crank pins, there being axial holes 5 inches in diameter through shafts and pins.

There is to be a complete installation of electric lights sufficient for lighting all parts of the vessel, and arranged in duplicate so as to guard against accident. The drainage system is to be so arranged that any compartment can be pumped out by the steam pumps. The vessel is to be submerged to fighting trim by means of valves, one in each transverse water-tight compartment of the double bottom; and sluice valves are to be fitted in the vertical keel and the water-tight longitudinals in these compartments. The only projections above the armour deck are the conning tower, smoke pipe, ventilators, hatch-coamings, and skid beams on which the boats are supported. The vessel has no armament, and is to rely entirely on ramming for her offensive power.—*Scientific American.*

MILITARY.

PRINCIPAL PROMOTIONS AND APPOINTMENTS DURING MARCH.

His Majesty Francis Joseph I., K.G., Emperor of Austria and King of Hungary, to be Colonel-in-Chief of the 1st (King's) Dragoon Guards.

Major-General R. Hale, from the 12th Lancers, to be Colonel of the 7th Hussars, vice Dickson transferred to 16th Lancers; Lieut.-General A. L. Lyttelton-Annesley to be Colonel of the 12th Lancers; Major-General and Hon. Lieut.-General W. T. Dickson, from 7th Hussars, to be Colonel of the 16th Lancers (in lieu of that announced in the March number); Major-General G. C. Blood, C.B., Indian Staff Corps, to command a first-class District in India; Lieut.-Colonel and Hon. Colonel Sir Francis C. Scott, K.C.M.G., C.B., retired, late half-pay, to be Hon. Major-General and a K.C.B., in recognition of his services in command of the Ashanti Expedition; Colonel W. Salmond, C.B., R.E., to be D.A.G. Royal Engineers, with the temporary rank of Major-General; Lieut.-General Sir A. J. Lyon Fremantle, K.C.M.G., C.B., Governor and Commander-in-Chief, Malta, to be General; Major-General C. M. Clarke, C.B., commanding the troops, Madras, to be Lieut.-General; Colonel B. A. Combe, C.B., commanding Cavalry Brigade, Aldershot, to be Major-General; Surgeon-Major-General J. Jameson, M.D., to be Director-General Army Medical Department.

The following are the most important items in the official statement of the Secretary of State for War with regard to the Army Estimates:—

The Army Estimates for the year 1895-6 showed a decrease of £22,100, a net result, which mainly arose from a considerable fall in the prices of supplies, partly counterbalanced by an increase of the Sinking Fund to repay loans under the Barracks Act.

In the Estimates for 1896-7 there is a decrease of £7,200 upon effective services and an increase of £10,000 upon non-effective, giving a net increase of £2,800 upon all services. Owing to the special grants made to Volunteer corps for 1895-6, and provided for in the Supplementary Estimate of 26th February, 1896, a saving of £199,700 is effected in the Volunteer Vote, but against this is to be set an increase of expenditure on warlike and other stores, and the additional expenditure required for the extended manœuvres to be carried out this year.

Changes of Establishment.—The proposed changes of establishment involve a net increase of 771 men to the Army. The principal changes provided for are the addition of 120 men to each of the three infantry battalions serving in Nova Scotia, Bermuda, and the West Indies, in order that those battalions may be augmented to the same establishment as other Line battalions serving in the Colonies; and the addition of two companies to the Royal Malta Artillery.

Re-armament of Horse and Field Artillery.—The re-organisation of the Royal Artillery, decided upon by the late Government, has been carried out, so far as regards the increase of the corps by one horse and seven field batteries; and special steps are now being taken to provide, as rapidly as possible, the new and the converted guns required. The whole of the Horse Artillery is to be re-armed with the new gun, and the sixty guns thus rendered available for the Field Artillery, as well as the whole of the guns already in its possession, are to be converted from 12-pounder to 15-pounder. It is highly desirable that the period of transition which this scheme involves should be as brief as possible, and it has, therefore, been decided to push forward the conversion of Field Artillery guns which is in progress at the Ordnance Factories, and to proceed with the new guns at a greatly accelerated pace, giving part of this latter work to the trade and part to the Factories.

Satisfactory progress is being made in giving effect to these proposals. A part of the new Horse Artillery equipment has already been supplied by the Ordnance

Factories. The remainder of the equipment which the Factories have undertaken to provide will, it is hoped, be delivered by the 1st of June; and that portion which has been given to the trade has been promised by the end of August. As regards Field Artillery, a number of guns sufficient to supply two Army-Corps will have been converted within three months from the present time. The conversion of the remainder will be proceeded with as rapidly as the engagements of the Factories permit. When the whole work has been completed, the present establishment of Horse Artillery will be in possession of its full complement of guns, and their reserve; while the Field Artillery will have its full complement of guns, its reserves, and a certain number of surplus guns.

Recruiting.—The recruiting for the Army during the year 1895 has been satisfactory. There has been no difficulty in obtaining the full number of recruits required, and the establishment of the Army on the 1st January, 1896, was complete. During the past five years there has been a progressive decrease in the number of special enlistments below the fixed standard, the percentage having fallen from 32·9 per cent. in 1891 to 19·9 per cent. in 1895. The Inspector-General reports that 67 per cent. of those enlisted under standard during the first six months of 1895 were found to have reached the full standard on remeasurement on 1st January, 1896. The loss from desertion during the past year was smaller than in any previous year since the establishment of the short-service system.

Militia.—The Militia Force generally is reported by the Inspector-General of Auxiliary Forces to be in an efficient state. There was an increase of over 1,900 in the number of recruits enlisted during 1895, compared with the enlistments in 1894, and also an increase of 400 in the number of Militiamen present at the training of 1895 compared with the previous year.

Yeomanry.—In the Yeomanry there has been a slight decrease in the numbers of men, but the strength of Officers is well maintained. The Force has much improved in efficiency under the brigade system, which promotes a healthy rivalry between regiments. Last year a deputation of Commanding Officers appealed to the War Office against the reduction which had been made in the lower rate of Contingent Allowance, and asks that a grant of £1 should be made for men who qualify in musketry but who are unable to attend drill or permanent duty. The desired concession has been granted, and provision is made accordingly in the Estimates.

Volunteers.—The condition of the Volunteer Force remains satisfactory. The number of Volunteers returned as efficient exceeded by more than 400 the figures for the previous year, but there was a slight falling off in the numbers present at inspection; the total for 1895 being 198,673 as against 200,592 for 1894.

Difficulty continues to be experienced in obtaining Officers for this Force, which is at present in this respect 1,800 below its establishment. An additional sum has been taken in order to assist Officers in providing an outfit. A further sum has been provided for grants to Officers attending schools of instruction.

The special extra payment to Volunteer Corps out of the sum voted in the Supplementary Estimate of the 26th February, 1896, will, it is hoped, place the finances of the Force on a satisfactory footing. The effect of the payment will be that every corps will receive, at about the ordinary time, an additional half-year's grant beyond the usual allowance.

Manœuvres.—Instead of the usual provisions for manœuvres, the Estimates for 1896-97 provide for carrying out manœuvres on an extended scale. A permanent measure for facilitating such manœuvres is before Parliament.

Hired Transports.—The new system of hiring transports, in lieu of maintaining troop-ships, has not been sufficiently long in operation to allow of a final decision as to relative expense, but the hiring system has not been very costly. For the year 1896-7 the programme of moves is exceptionally small, and there is consequently a considerable reduction in the estimated cost.

Clothing.—The Clothing Vote shows an increase of £18,000, mainly attribu-

table to expenses for the manœuvres, and the cost of completing the issue of helmets for the Militia. Prices also rule higher than last year.

Magazine Rifles.—The progress in the manufacture of magazine rifles is satisfactory. The trade companies will have delivered about 205,000 of these rifles for the Army by the end of this year. The Ordnance Factories had supplied about 307,000 up to 31st March, 1895. They have, during the past year, been chiefly engaged in converting Martini-Henry rifles, the only magazine rifles produced being those required for the Navy. The whole of the Regular Forces at home and abroad and the Militia having been armed with the magazine rifle, and the necessary reserve of the same weapon having been provided, it has been decided to re-arm the Volunteers with the magazine rifle, and the manufacture of this rifle will now be proceeded with. The necessary provision for this purpose has been made in the Estimates.

The Martini-Henry rifles which have already been fitted with the ·303 barrel will be available for reserve purposes.

Cordite.—The experiments which have been carried on by the Ordnance Committee with a view to testing the keeping qualities of cordite have given very satisfactory results. Time alone can fully test the extent of its keeping qualities in all climates, but in all the experiments and trials to which it has been subjected it has never been rendered unserviceable. The trade has now begun to make regular deliveries of cordite, both for guns, and in made-up cartridges, for the magazine rifle. Although the trade output is not as yet large, there are grounds for hoping that it will gradually increase during the coming financial year and will form a valuable addition to our resources.

Small-arm Ammunition.—By means of the supplementary sum voted during the present year, considerable advance has been made towards the completion of the reserves of small-arm ammunition. It is necessary, however, to take a further increased amount, in order to bring them up to the proper standard.

Works.—The Works Vote provides for but few new services to be undertaken during the year; the increased expenditure of £18,100 is chiefly due to an automatic increase in the amount payable for annuities under the Barracks Act. The sums of £4,100,000 raised under the Barracks Act of 1890, and the £2,600,000 raised under the Imperial Defence Act of 1888, having now been virtually exhausted, it is intended, by means of a further loan, to proceed with urgent services for Imperial Defence, and to provide for a steady prosecution of barrack reconstruction.

The condition of the buildings in which a large part of the troops are housed, both at home and abroad, renders considerable expenditure for the latter purpose absolutely necessary.

Ranges.—Owing to the increased range of the ·303 rifle, which has rendered many of the old ranges unsafe, the acquisition of extended ranges has become an urgent question, and it is proposed to provide the necessary funds for this service also by means of the loan above mentioned.

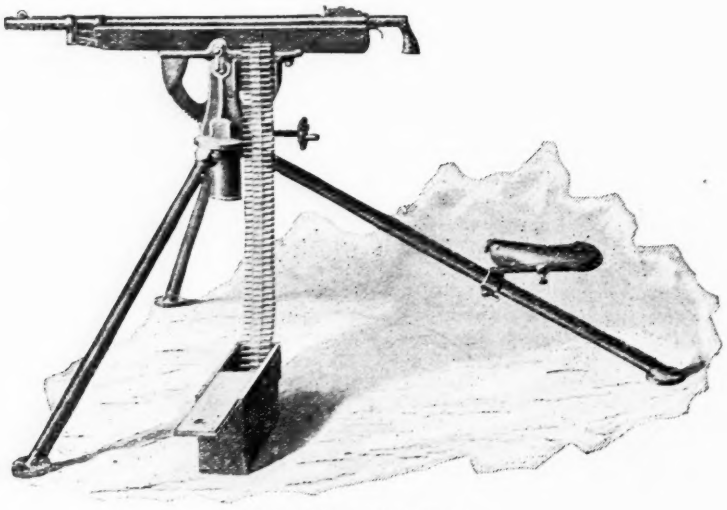
Non-effective.—The increase of £10,000 upon the Non-effective Votes is chiefly due to increased retirements of regimental and civil Officers and to special campaign pensions.

LANSDOWNE.

5th March, 1896.

The latest addition to Machine-Guns is the Colt Automatic Gun, manufactured by the Colt Patent Firearms Manufacturing Company, under Browning's patent; and the following is its description and capability as claimed for it by the inventors. It is the result of exhaustive experiments and the perfecting of a method whereby the powder gases are utilised to work automatically the firing, ejecting, and reloading mechanism. The light weight of the gun (40 lbs.) and its compact size make it especially suitable (when mounted on tripod) for use by cavalry or infantry. It is

fitted to a light tripod, can be carried by a trooper in a cavalry boot, the whole equipment being readily transported and handled in action by one man; the operation being practically like firing a pistol. It can be fitted on any kind of carriage or on the parapet of a fortification. Eight thousand rounds have been fired from it without a hitch or showing any wear or weakness. At 200 yards for accuracy, 100 consecutive hits were made in 16 seconds. Its arm consists of one barrel attached to a breech casing, in which the mechanism for charging, firing, and ejecting is contained. The barrel will withstand the heaviest charges of nitro-powder, and its accuracy is not disturbed by the vibrations incident to rapid firing. It does not heat as rapidly as the light barrels of other systems; therefore the water jacket for cooling is not required. The cartridges are fed automatically by belts coiled in boxes readily attached to the breech casing, and moving with it. Thus the supply of cartridges is not disturbed by the vertical or horizontal movement of the gun. The boxes contain 100, 250, or 500 cartridges each, and are so constructed that they can be quickly attached or removed. The automatic action of the gun is effected by means of the pressure of the powder gases in the barrel, after the projectile has received its maximum velocity, without decreasing its range or penetration. The gas is admitted through a small radial vent in the barrel somewhat in the rear of the muzzle, opening downward from the bore. It is closed by a piston which fits in the gas cylinder surrounding the outer edge of the vent, and is pivoted to the gas lever so that it adjusts itself to the gas cylinder, while the lever swings in a vertical plane.



COLT READY FOR ACTION.

In operation, the feed belt is entered and the lever is thrown down and rearward (once by hand) as far as it will go; this opens the breech and feeds the first cartridge from the belt to the carrier; the lever is then released, and the spring causes it to swing forward, close the vent and transfer the cartridge from the carrier to the barrel, also cocking the hammer and closing and locking the breech. On pulling the trigger the shot is fired, and after the bullet has passed the vent, and before the exit from the muzzle, the powder gases expand through the vent upon the piston and gas lever, which in turn act on the breech mechanism, opening the breech, ejecting the shell, and

feeding to the carrier another cartridge. The gas lever returning, forces home the cartridge in the barrel, closing and locking the breech. If, instead of releasing the trigger, it is held back, the same operation will be repeated so ong as cartridges are supplied, producing a continuous fire at the rate of 400 shots or more per minute.

As the automatic action of this gun is due to the direct effect upon the lever of the pressure of the gases through the vent, in contradistinction to that class of automatic arms in which the recoil of the barrel is depended on for actuation, the delicacy of the parts necessary in the latter class is avoided in this gun ; therefore, the barrel and the storage springs are of greater strength, and yet effective with even small charges. A safety lock is provided, which securely locks the hammer and prevents it from striking the firing pin. It is to be used only when a loaded cartridge is left in the chamber. The hammer of this gun is also used as a piston for an air pump, which forces a strong jet of air into the chamber and through the barrel, removing all residue or unburnt powder after the empty shell is extracted. The want of such a device has been shown by the experience of other guns, and is still greater when using smokeless powder. The main spring, firing pin, and extractor can be replaced as easily and as quickly as in the ordinary bolt gun, all these parts being removable from the rear of the arm without displacing a single screw.

A contract for fifty of these machine-guns has been given by the U.S. Navy, their bore being that of the new Navy service small-arm. A good deal of credit is accorded to the company for its success in designing an automatic machine-gun capable of acting with the ·236-inch bore cartridges. It is a great consideration with the U.S. Navy to secure a machine-gun having this important characteristic, because the problem of supplying small-bore ammunition is very much simplified by having a common storage and system of distribution for small-arms and machine-guns.

On the subject of the Colt automatic gun, Mr. Maxim communicated the following letter to the Press :—

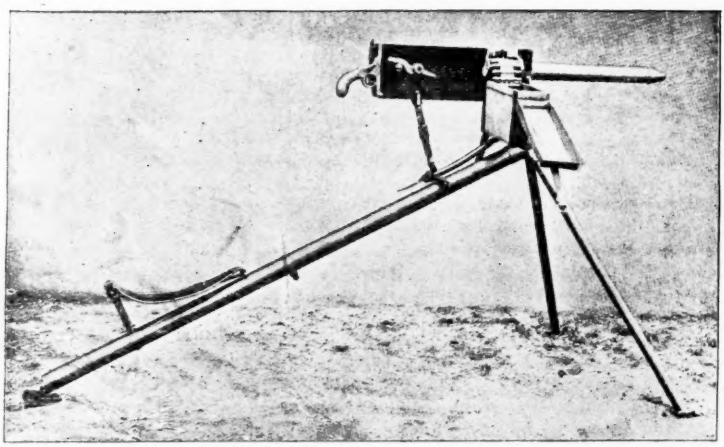
"I have seen a description of the so-called new Colt gun which is said to be patented by John Browning. Upon a close examination of the drawings and specification relating to this supposed new form of arm, I find that there is nothing in it which has not been patented by myself in every country in the world where patents are granted, and as I was the first man to do this, I naturally took out some very broad claims.

"As to the statement that this supposed new gun heats less than the Maxim, and consequently does not require a water-jacket, there may be some truth in this, because this imitation of a Maxim gun, weighing 40 lbs., only fired at the rate of 400 rounds per minute between stoppages; and there were no less than fifteen of them in the 400 rounds test. They claim to have fired 1,155 rounds in five-and-a-half minutes. This, however, is disputed. But the Maxim gun weighing 40 lbs., and which was shown before the War Office Committee at Enfield, actually fired 666 rounds in one minute, 1,000 rounds in a minute-and-a-half, and 2,000 rounds in slightly over three minutes, and this with a single pull of the trigger without stoppage. A certain amount of heat is developed with every cartridge fired, the greater the number the greater the heat. When required we also make guns without water-jackets. They weigh 25 lbs. each, and fire 600 rounds a minute."

So far as it is possible to form an accurate opinion without actually seeing and handling the gun, the Colt appears to bear a close resemblance to the light ·303 Maxim. Each can be carried in boot, on pack saddle, or mounted on any kind of carriage ; and each can be fired for a certain time without water-jacket. They are both fed by a canvas belt from a wooden box, and they are both automatic and can fire

some 400 rounds or more per minute. Both systems can be applied to barrels of any calibre, and the full weight of each, including tripod, is about 40 lbs.

The fact that 50 Colt machine-guns have been ordered for the United States Navy is in itself a high recommendation, implying that the gun has passed successfully through severe and searching trials. But whether it is more effective than the light Maxim, which has been known to make a score of 80 per cent. of hits at 500 yards, and 60 per cent. at 800 yards, at a running target about the size of a railway truck 9′ × 24′, at a trot, remains to be proved.



MAXIM READY FOR ACTION.

The extraordinary accuracy of the machine-gun under favourable circumstances, is still hardly realised. It is indeed curious to note how slowly it is making headway in the armies of the world. Excepting for naval warfare, no great military Power has as yet boldly grasped the subject. Russia, Germany, France, Austria-Hungary and Italy seem each to be waiting for the other to introduce it throughout their armies. The Austrians have certainly a capital machine-gun of their own, the Dormus (also believed to be an infringement on Mr. Maxim's patent). Indeed, its principal difference besides its control of the rate of fire, appears to be its cost which is understood to be only £60, instead of some £260 or £450 for the light or heavy Maxim. The Dormus, however, so far, has only been mounted by the Austrians on their fortifications. The Swiss have introduced the machine-gun to a large extent throughout their army, and their Maxim equipment seems well adapted to the mountainous nature of their country. The French are rumoured to have used machine-guns in Madagascar, but, though probable, no authentic confirmation of the rumours has yet been received.

The Germans, in spite of their perfect organisation and practical military knowledge, are still inclined to cling lovingly to the legends of the Franco-Prussian war. "Mitrailleuses," said a distinguished cavalry officer a few days ago, on the mention of machine-guns, "Mitrailleuses! what use were they in the war?"

True, they failed, but five-and-twenty years have passed since then; the machine-gun has been improved; and the tactical blunders that then trammelled their employment will probably be avoided in future. For instance, machine-guns were placed on batteries exposed to artillery fire which eventually overwhelmed them. This mistake is not likely to be repeated. Again, in 1870, the men who worked the mitrailleuse were not properly trained, and were often ignorant of the

weapon which had been hurriedly served out when the war began. Nevertheless, the mitrailleuse did considerable execution on the glacis North-East of Sedan, sweeping away whole sections of victorious Bavarians advancing from Bazailles, until the guns themselves were crushed by Prussian shells.

Of the long stride made from the mitrailleuse of 1870, to the machine-gun of to-day, a good instance exists in the efficiency of the Maxim in the Matabele War of 1894. Eye-witnesses assert that these guns proved effective on large bodies of the enemy at a distance of 2,000 yards, while there is the strongest evidence of their stopping powers at shorter ranges. On the other hand, it may be said that recent events in the Transvaal too clearly demonstrate how machine-gun ammunition may be wasted.

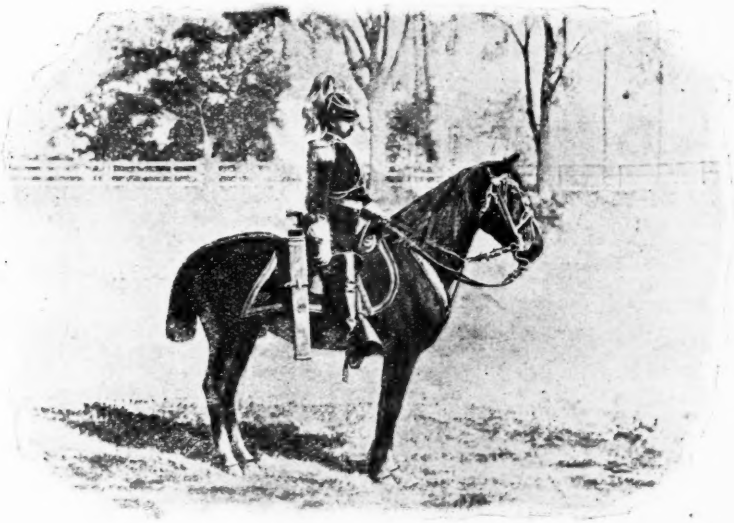
The fact is that the machine-gun is not adapted for skirmishing against individuals behind rocks or in shelter trenches, though it has been used effectively in the United States of America against Indians hiding in high grass. In the latter case, to use the language of one present "it made those Indians get." But in the main, its fire should be reserved for formed bodies on roads or in the open.

MAXIM MOUNTED.

The regulations laid down in the Cavalry Drill Book are both brief and complete. The gun will probably be found to be most effective when its fire is unexpected, and it should be so mounted that it can cross any kind of country with the utmost rapidity. This question of mounting has ever been a stumbling block. Attempts to solve it have been made for a decade, and have not succeeded yet. It is acknowledged that the present cavalry carriage is not the best. A few months ago a trail and limber was proposed, but it was deemed too heavy with the ammunition it was designed to carry. An experimental cart of a different pattern is now being constructed, and another carriage has been designed by the colonel of a distinguished cavalry regiment, the details of which have not yet been promulgated.

Though wheels, shield, and water jacket are required when possible, there are occasions when the gun could come into play without them, in which case a boot or pack saddle should form part of the equipment of every gun.

The *Revue du Cercle Militaire*, in which appears a description of the Colt, along with the picture of the United States Dragoon here illustrated, thinks the weight of the gun too heavy for a mounted man to carry in a boot, and it ought to be reduced. Most cavalry soldiers will agree that 35 or 40 lbs. is too great a



COLT MOUNTED.

weight to be carried in a boot for any great distance, but it is nevertheless a quick and handy way of getting the gun across intricate country when seconds, not minutes, are of the utmost value.

A description of the Colt machine-gun, mounted on the cycle as illustrated, appeared in the *Scientific American*, in which it states that it "can easily be directed at any angle, and does not interfere with the steering of the machine." How the gun is to get stability is not shown. Without stability it is useless, but if it is propped up or mounted on a tricycle like the Maxim, it would prove a valuable weapon for roads and street fighting.

A most important point in the use of machine-guns too often overlooked is the training of the men to work them. They must have experience, they must be good shots, and rejoice in the possession of cool heads and iron nerves, just as their leader must be endowed with quick resource and judgment. It is not everybody who can play the fiddle. And the most experienced readers of this JOURNAL will probably agree that it requires an expert to handle a machine-gun successfully in the field. In the meanwhile no prizes are offered for machine-gun shooting, and there is no regular course of firing laid down. This in itself would not so much matter were the supply of ammunition for practice dealt with more liberally. Except at Aldershot, the present allowance is 500 rounds blank and 400 ball per annum, and could all be fired away in less than two minutes.

Machine-guns are frequently ignored in the war game. Few regiments have

as yet had the use of them, and the vast capabilities of the weapon, when properly used, are not appreciated by the Army in general. Who will deny that at Adowa, only three weeks ago, a few machine-guns properly worked might have saved the Italian Army in Abyssinia, and turned defeat to victory?

COLT BICYCLE.

At last an order has been given for every British cavalry regiment to be supplied with a machine-gun. This will do something to place the cavalry more on an equality with that of foreign nations. For at this moment a British cavalry regiment meeting a cavalry regiment of either Germany, Austria, Russia, or France, would be outnumbered by some 200 to 400 men, and a British division would in like manner be outnumbered by an average of more than 1,000 sabres.

The following brief recapitulation of the several works on Military Equitation in the British Cavalry may serve the purpose of a preface to that portion of the new "Cavalry Drill Book" which treats of riding. Last month's JOURNAL of the R.U.S.I. contained a portrait of the Earl of Pembroke, whose first work on "Military Equitation: or, the Method of Breaking Horses and Teaching Soldiers to Ride," published in 1761, was alluded to. In the 1795 edition of the work, which was then approved by the Adjutant-General for use in the Army, the length of the stirrup was characterised as too long for riding in the ranks. In 1807, Captain R. Skeene, many years Riding Master of the Maidstone Depôt, published, what is generally recognised as the first manual of equitation drill, his "Progressive Military Instruction for forming Men and Horses in the Rudiments of Cavalry Service"; it was dedicated to, and sanctioned by, the Duke of York, Commander-in-Chief of the Army. Twelve years later, namely, in 1819, was issued the first manual of equitation drill, issued by authority. It was entitled "Instructions in Military Equitation, and in the Elements of Field Movements of Cavalry"; and lengthened the stirrups two holes, in imitation of the objectionable system then in vogue on the Continent.

The "Regulations for the Instruction, Formation, and Movements of the Cavalry," framed by a Board of General Officers, and published in 1833, introduced "the back of the hand to the front," "top of the thumb firmly closed on the bit reins." When Colonel Meyers, Riding Master of the Riding Establish-

ment, succeeded Lieut.-Colonel Peters in that office, at St. John's Wood, in 1826, he made the alterations in the hand and seat which the authorities embodied in their Regulations of 1833. "I found," he writes, "the hand hard and heavy instead of being light, and the seat too much on the fork, and stirrups too long, which I took up two holes." Various editions of the "Cavalry Regulations" were published in 1844, 1851, 1859, 1862, 1865, 1869, and in 1876. The latter edition changed the title to "Regulations for the Instruction and Movements of Cavalry"; it introduced riding on the numnah for recruits, and slightly altered the stirrups, according to the shape of the rider's legs and the girth of the horse. In 1885 and 1887, further editions of the "Regulations for Cavalry" were published, in the former of which was mentioned for the first time riding on four reins, and it sanctioned horses being so ridden when considered necessary. The "Cavalry Drill" of 1891 introduced several useful points, such as "Take up your bridoon reins," thus riding on the bridoon with two hands, for the better balance and greater ease of the horse. And when riding in all four reins with sword drawn, the right bridoon rein was to be placed across the left hand: this had hitherto been generally practised, but never laid down.

Notwithstanding the mass of information contained in the above works, the authorities of the Riding Establishment issued a publication of their own in 1852, 1874, and 1888, entitled "Book of Aids, for the use of Non-Commissioned Officers and Assistants in Riding Schools." But it was withdrawn on the publication of the "Cavalry Drill Book," 1891, which incorporated most of its good points.

Since Major Charles Adolphus Quist published, in 1808, his "Horse Drill or General Horse Exercise," for the use of the Royal Artillery, the Royal regiment has on its account also issued various publications embracing equitation, long rein driving, breaking young horses to draught, instruction for drivers, and sword and carbine exercise. These appeared in 1860, 1861, 1875, 1877, 1881, 1889, and 1893. In the edition of 1889, long rein driving was introduced, but breaking young horses to draught omitted. The following addition was made:—"Some horses may require to be ridden more on the bridoon than on the bit. The sanction of the commanding officer should be obtained that such horses may be ridden on all four reins in the left hand when manœuvring. In order to do this, pass the fore-finger of the left hand over the right bridoon rein," etc. In the 1893 edition the equitation was to be taken from the "Cavalry Drill Book." The Riding House Establishment at Woolwich, it may be added, was formed on 1st September, 1808, and placed under the command of Major C. A. Quist.

The Army Service Corps, and its predecessor, the Military Train, have similarly issued publications of their own, embracing riding, harness and driving drill, care of horses on the march and in billets, and other information, founded chiefly on the Cavalry and Artillery Text-Books. The first, published in 1862, was entitled the "Military Train Manual"; it adopted the system of riding as taught at Maidstone, and the harness and driving of the Royal Artillery. The last, which appeared in 1891, bore the title of "Army Service Corps: Drills and Exercises"; and it adopted the Equitation of the Cavalry Regulations of 1876.

Amongst the interesting objects lately added to the Museum of the Royal United Service Institution is the coatee worn by General Sir William Napier, the historian of the Peninsular War, during his service with the 43rd Light Infantry in that campaign. He was with the 52nd in 1803-4, and went on to the 43rd as a captain in the latter year, obtained a regimental majority in 1812, and went on half-pay in 1819. It will interest the officers of the regiment to know that the coatee is in a case just under the old colours which were presented to the 43rd at Valenciennes in 1818, when Napier was on parade as a major.

The coatee is the ordinary jacket worn by officers of all light infantry regiments, and also by the officers of light companies in line battalions, during the Peninsular Campaign.

The silver shoulder ornaments are unfortunately missing. Captains and lieutenants of the 43rd wore silver wings on their shoulders, formed of silver scales, edged all round with silver cord; silver bullion fringe about one inch and a quarter deep, hanging on the shoulder from the outside edge; a gilt bugle in the centre of the shoulder.

As a field officer, Napier would wear silver epaulettes over the wings, the latter only just showing from under the falling bullion fringe of the epaulettes.

A sword used by the Duke of Wellington during the earlier portion of his service, the cocked hat worn by him at Seringapatam, and the cloak which he wore at Waterloo, have also been added; together with a curious gun-telescope used by Lord Raglan in the Crimea. Lord Raglan, it is well known, lost his arm at Waterloo, and the telescope was fixed to a gun-stock to enable him to bring it to the shoulder.

Lieut.-Colonel Lord Raglan, Royal Monmouthshire Engineer Militia, has contributed a valuable article on the Militia to the April number of the *National Review*. Without going into detail, it may be mentioned that Lord Raglan advocates greater power to commanding officers during the non-training period; that all officers should enter the Army through the Militia, and that those retired from the Army under the age of forty, and receiving pay, should serve for five years in the Militia with half pay; the introduction of higher examinations for officers; the appointment of an assistant adjutant-general for the Militia; the same pay for N.C. officers not on the permanent staff as for similar ranks in the Army, and increased bounty; the abolition of the Militia Reserve, and the enlistment of the entire Force for foreign service; better clothing and equipment; and the voluntary attachment to the Militia as supernumeraries of Army Reserve men. The article displays a thorough acquaintance with the Force and its requirements, though many of the writer's contentions will no doubt occasion controversy. It has always been a drawback to the Militia that its officers lack unanimity in their demands.

The report of the Field Practice Association for Yeomanry and Volunteers shows that during the past year 14 regiments of Yeomanry, 72 battalions of Volunteers, and 309 individual officers subscribed to the Association, and 51 field troops of Yeomanry, and 886 sections of Volunteers entered for the various matches. The first year's work of the Association is considered very satisfactory.

FRANCE.—The Engineers, the Department of Public Works, and the town of Lille, have come to an agreement with regard to the proposals for the demolition of the old fortifications by Vauban, which are still in existence. They will be replaced by a simple continuous rampart on the lines of that which was constructed under the Second Empire, when the communes of Esquermes, Wazemmes, and Moulins, were annexed. The innumerable hornworks, bridgeheads, bastions, redans and ditches, put together by the great engineer, are in reality useless at the present day.

One cannot fail, however, to be struck with the fact that the scheme is so contracted, the line of defence being withdrawn more than a hundred yards. It leaves outside of the town the very large suburbs of Fives and Saint Maurice, inhabited by more than 40,000 people, and the communes of La Madeleine, Saint André, Mons-en-Barœul, and Hellemmes, with a united population of more than 20,000. These suburbs cover the small heights where, in every attack on Lille, the besiegers have established themselves. Their unbroken and ever-extending

screen of houses, will obstruct the view from the rampart, just as it does now, and they will conceal any enterprising enemy who may force the line of forts, or who may boldly pass between them. The proposed defences have but a very questionable value.

The solution which should have been adopted, is that employed at Lyons, where the engineers have built, at a great distance, a very simple rampart, called a "safety embankment," sufficient to stop a sudden attack, and to prevent panic. It embraces not only the town but the suburbs, extending over a vast area. The approaches to the place are also easily observed, and an enemy could not reach the approaches to the body of the place with the aid of emissaries hidden by the suburbs, nor by the incursion of forlorn hopes through the meshes, which are always too wide, in the network of the forts and batteries of an entrenched camp. —*Le Temps.*

A useful reconnaissance was executed at the autumn manœuvres last year by a lieutenant of the 19th Dragoons and a party of fourteen men, selected by himself for the service on which he was detailed. The men, though fully armed, carried nothing but a sponge, a currycomb, and a little hay. The party started at midnight on the 8th September to obtain information of the enemy's positions and movements, and rode till eight o'clock next morning, when, by order, they halted until five in the afternoon. After this long rest, they rode till midnight, when, on reaching a village, they halted three hours, and obtained food and forage from the inhabitants. At three o'clock in the morning they were again in the saddle. Owing to traces of recent bivouacs, they left the roads and took to the woods, and in the course of the morning slipped unperceived through the opposing cavalry screen, and established contact with the enemy's columns. With three men only—for he halted his main body—the lieutenant worked along the whole flank of the left wing of the enemy's army, and obtained valuable information, which he telegraphed to the town to which he had been ordered to report. At seven p.m. the party had a meal at a wayside *cabaret*, and after a further march bivouacked on a path close to the high road. A *vedette* watched the road, the horses were saddled and bridled, the men slept with their carbines by their sides. Next morning (10th) they joined their regiment, and did not arrive at their quarters for the night until five p.m., when, after a ride of more than 200 kilometres (about 113 miles), both men and horses looked well and by no means tired out. Four horses were not unsaddled during forty-eight hours; of these one was back in the ranks after one day's rest, but another developed a sore back, which required six days to cure. Their feet and legs were all in good case. The maximum speed was 10 kilometres an hour, the minimum half that rate.

One of the military magazines contains an epitome of the opinion of the Russian General Dragomiroff on the French Army, which he studied at the manœuvres held in France in the autumn of 1895. The general was deeply impressed by the extraordinary toughness of the men, who, small, dry, always bright and good-tempered, never seemed "sick or sorry." The officers took the greatest possible care of their troops. The horses were roughly treated; they had any amount of forage, but they were tremendously hard-worked. After commenting on the enormous improvement in the Army, Dragomiroff remarks on the change in the type of the average French officer—a change so marked that no one whose recollections go back to the days of the Second Empire can fail to notice it. The present officer "is more concentrated, incomparably more in earnest and more simple in his tastes, very well educated and very hard-working."

An interesting winter march was made in Savoy last month by a company of the 13th Alpine Battalion. They started from Lanslebourg, near the Northern end of the Montcenis Tunnel, on the 18th of March, with three days' rations in their haversacks; their destination was some châlets at the foot of the Vanoise Col,

about 7,400 feet above the sea. When the troops reached the Col, they found it was impossible to approach the châlets owing to the masses of snow and ice by which they were surrounded; and as there was no human habitation within seven hours' march, there was nothing for it but to bivouac on the snow. Next day they returned to their quarters in a violent blizzard, after an eighteen hours' march, of which twelve were on snow shoes. Altogether the expedition lasted thirty-seven hours, and it is considered to have been successfully conducted, as no troops have hitherto succeeded in reaching the Vanoise Col at this time of year.—*Revue de Cavalerie* and *Spectateur Militaire.*

JAPAN.—As was stated last month, the Japanese Government are bent on doubling the strength of their army. It appears that in order to increase the Reserves, the service with the colours is for the present to be reduced to eighteen months instead of three years, and the peace strength of the battalions is to be augmented and the yearly contingent of recruits increased. The military schools are to be added to, so that officers trained theoretically may be ready to hand in case of emergency. The manufactories of military *matériel* are to be increased. The railways are to be re-organised in view to rapid concentration at the ports of embarkation, the late campaign having revealed many deficiencies in this respect. The development of the fleet proceeds rapidly.—*Deutsche Heeres-Zeitung.*

RUSSIA.—Russia's Organisation for Defence was the subject of a lecture delivered by Lieutenant-General Zabotkm, of the Russian Engineers, on the occasion of the seventy-fifth anniversary of the foundation of the Nicholas School of Military Engineering, a *précis* of which will enable our readers to form an idea of the progress made in Russia since 1882, when an extensive account of the Russian Defensive Forces was written for this JOURNAL (Volumes XXVII. and XXVIII., 1883 and 1884), by the late Sir Lumley Graham, to whose untiring industry the Institution owed so much. A German Study of operations in the Polish theatre of war was translated for this JOURNAL by the late Lieutenant-Colonel Rothwell, R.A., and appeared in No. 112, Vol. XXV., and the map accompanying it should be consulted while reading the following notes.

On the 27th March, 1882, the late Tsar gave his final decision on those defence questions, which had been discussed since the war of 1870, under the Emperor Alexander II., and the construction of the fortifications sanctioned was commenced at the end of the year.

The new system of defence embraces, as did the old one, the fortresses Novo-Georgievsk, Warsaw, Segrsche, Ossowetz, Kowno, and the Fort Dubno. It forms an extended quadrilateral, of which the four angles are marked by the fortresses Novo-Georgievsk, Ivangorod, Brest-Litowsk, and Ossowetz. Two sides are bounded by the watercourses of the Weichseb, and the Narew and the Bohr, the other two by the Wieprz and the Narew.

On the Narew, Pultusk, Roschau, Ostrolenka, and Lomzha form *places d'armes.*

The fortresses Novo-Georgievsk, Warsaw, and Segrsche form a fortified strategic circle, which commands the junction of railways leading to the interior of Russia, and contains within its own radius magazines of war material and food supplies. This strategic centre is, therefore, of great importance to Russia for offensive as well as defensive purposes. This outer defensive arc is bounded on the right flank by the fortified places on the Niemen, which include the first-class fortress Kowno and the semi-permanent works at Grodno and Olita. On its left flank are the permanent fort Dubno and the fortified positions Sutsk and Rovno. The southern part of the western boundary must at present rely for its defence upon field artillery. On the northern side, however, the possibility of a combined attack by land and sea has led to the resolution to fortify Libau. This fulfills the double

mission of preventing an enemy occupying it and of affording a supporting point whence a comparatively weak naval force could hamper the active operations of a hostile fleet against the Livonian and Finnish coasts.

On her other borders Russia has only Kars, the possession of which was gained in the war of 1877-78 against Turkey, besides certain fortified posts in Central Asia.

As regards sea-coast defences she has continued the works commenced on the fortresses Kronstadt, Kertch, and Otschakoff.

To ensure the development of her Navy, Russia has been compelled to fortify certain points—Libau on the Baltic, Sebastopol on the Black Sea, Wladiwostok on the Pacific. These fortresses have been armed to ensure combined action for the defence of Russia's exterior line. Her old fortifications have been changed into depôts or magazines such as Dunaburg, Bobrinsk, and Kieff. For her seaboard certain places have been selected, and their fortifications have been restored, in order that they may serve as bases for the active operations of her fleet, and though much has yet to be done, the general plan to attain her object has been decided on and the means thereto have been discussed and settled.—*Deutsche Heeres-Zeitung.*

The following march of two batteries to the Amur-darya is reported from the Kansk Province of Jeneisk. On the 5th (17th) August, the 1st and 2nd Batteries of the independent Trans-Baikalic Division arrived here.

The batteries taken from the 35th Artillery Brigade (from the garrison of Riasan) had been forwarded in the beginning of June by rail to Omsk, which took eleven days.

This march is unexampled in our times. The batteries have marched (without counting the railway journeying) 1,700 versts (1,122 miles) from Omsk to Kansk, and they have as many again to march between now and the beginning of winter. The batteries on a war footing march daily 40 to 50 versts (26 to 33 miles), with but few halting days, and are accompanied by a long train and a double number of horses. The remount horses were purchased in Tomsk for delivery to the other arms of the service in the Trans-Baikal, and are far inferior to those brought from Russia. On the whole, but few good horses are to be found in Siberia, and they are accustomed to different harness, grooming, etc.

The marching troops were received as hospitably as circumstances would allow by the local levies stationed in the Military District of Irtutsk (Cossack frontier guards, convoy escorts, etc.). The officers' families followed with regular relays of post horses.

The district troops thus saw for the first time real guns in the flesh (for they have no artillery in the whole district), and the batteries were exercised and manœuvred, blank cartridges being used for the firing exercises. The guns were inspected, their service explained, etc.

Military manœuvres of the troops taken from three districts will be held near Smolensk in September, at which the Tsar has expressed his intention of being present. After these, which are to be of a spectacular nature for the edification of His Majesty's foreign guests, grand manœuvres are to take place in the military district of Kieff. Troops from the districts of Odessa and Warsaw are to participate, and General Dragomiroff will have supreme command.—*Militär-Zeitung.*

SWEDEN AND NORWAY.—Within the last few years Sweden and Norway have adopted universal military service. In the former country, the periods prescribed are eight years in the first ban, eleven in the second, and eight in the Landsturm. Each man, during peace, puts in ninety days of military duty. The first

ban is intended to fill vacancies and to bring the standing army up to war strength when necessary. The army consists of twenty-six infantry regiments and four independent infantry battalions. Of these regiments two are guards, two grenadiers, twenty-one line, and one Jäger; while of the battalions one is grenadier, two line, and one Jäger, in all fifty-six battalions of four companies each; but in case of war, and for the manœuvres, a third battalion is to be added to each regiment.

There are eight regiments of cavalry, one being guards, four hussars, and three dragoons, in all fifty squadrons. The field artillery is composed of six regiments of six batteries each; the horse of four batteries, with eight guns each, the guns of the field batteries being 8 centimetres, and those of the horse 7 centimetres. There are two corps of fortress artillery, two battalions of engineers, and four battalions and two companies of train. In peace, the army is made up of six divisions, which in war would consist of two infantry brigades, one cavalry regiment, one field artillery regiment, one company of engineers, and one train battalion. The whole Swedish Army has a peace strength of 38,000, but would be increased on a war footing to 452,000, including reserves.

In Norway the periods of service are five years in the active army, four in the Landwehr, and four in the Landsturm. Recruits are not taken under the age of twenty-three years, and their drill periods vary from eighteen to seventy days, according to the arm in which they serve. Every Norwegian belongs to the Landsturm until he is fifty years of age. There are five infantry brigades in the army, four corps of light cavalry, three corps of field artillery, three battalions of fortress artillery, and five schools for under officers. On a peace footing, the strength of the army is 1,700 officers and 18,000 men; in war-time it would be about 40,000.—*Deutsche Heeres-Zeitung.*

SWITZERLAND.—A most elaborate programme of the special work to be carried out by the Swiss Army during the present year has been issued. It is arranged under the headings of:—I., Head Quarters Staff; II., Infantry; III., Cavalry; IV., Artillery; V., Engineers; VI., Sanitary troops; VII., Administrative troops; VIII., Fortress troops; IX., Central Schools; X., Autumn Manœuvres of the IIIrd Army-Corps. The course for the Staff includes a "staff ride" in Central Switzerland from 9th to 29th July; that for the infantry a musketry course for the officers, varying from two to four weeks; tactical courses for officers of the cavalry; gun practice course for artillery officers of from fourteen to sixteen days; a technical course of twenty-two days for engineer officers; and a course at the Central Schools for captains, lieut.-colonels, and superior officers, varying from forty-two to eighteen days. The Autumn Manœuvres of the IIIrd Army-Corps will, as already announced, commence on the 8th September, on the termination of the preparatory courses above alluded to. They will begin by the exercise of regiment *versus* regiment, and will last until the 18th September, when all the troops will be dismissed, except a detachment of the supply train of Corps III., the train sections attached to it, and field hospital train, which will be dismissed on the day following. The manœuvre ground will be the same as for the regimental and brigade manœuvres, viz., between Gossau and Regensberg (Zurich).—*Revue Militaire Suisse.*

TURKEY.—Nearly the whole of the Turkish Army is now placed on a war footing. In the first five army-corps regions:—Constantinople, Adrianople, Monastir, Erzerum, and Damascus, the Reserves have been called out, so that (excepting Yemen, which has no Reserves) Bagdad is the only region now remaining on a peace footing. This mobilisation has been much facilitated by the exertions of the German officers who have assisted the Turkish Government

in introducing the German organisation system. These officers have established the territorial system, formed strong permanent cadres, arranged for the transfer to the Reserve Army-Corps of complete units of troops of the special arms from the active army, and finally have succeeded in collecting and storing the necessary war material.

As is well known, the Turkish Army is now distributed in seven army-corps regions and three divisional regions: Hedjaz, Tripoli, and Crete. Each of the first six army-corps regions can mobilise four army-corps :—

1 active corps.
2 reserve corps.
1 territorial corps.

Each army-corps consists of :—

2 infantry divisions = 8 regiments,
1 cavalry brigade = 2 regiments,
1 artillery ditto,
1 engineer battalion,
1 train ditto,

with the usual technical troops.

In all the first five regions, permanent cadres of the Reserve Corps are formed as regards the infantry.

In the 6th Corps Region (Bagdad) only the cadres of thirty-two infantry battalions, *i.e.*, enough for one reserve corps, are formed.

There is no report as yet regarding the issue of magazine rifles to the troops, but a sufficient supply of these is believed to have been stored for this purpose.—*Militär-Zeitung nach Novosti.*

An Imperial Irade has just appeared, dealing with the redistribution of the Turkish forces. Macedonia and the Western half of the Balkan Peninsula have hitherto been occupied by 61 battalions, 35 squadrons, and 51 batteries, of which 10 battalions and 5 squadrons belonged to the 1st or Constantinople Army-Corps, while 11 battalions and 12 batteries belonged to the 5th or Damascus Army-Corps. These troops will now be joined to the 3rd Army-Corps, the headquarters of which will be moved from Monastir to Salonika. It is to consist, henceforward, of four divisions of 17 battalions each, in all 68 battalions, and to be distributed as follows :—

There will be one division on the Greek frontier, one on the Montenegrin and Bosnian, one on the Servo-Bulgarian, and one on the Bulgarian at Salonika.

The Crete brigade will be attached to the 5th Army-Corps, and one division of that corps will be stationed in Syria, the others in Crete. The strength of the El Hedjaz division, which garrisons the holy places of Islam, will be increased from 12 to 17 battalions. The formation of the 7 supplementary battalions for Macedonia has been already commenced by the raising of 2 Jäger battalions, and it is hoped that, during the spring, all of them will have a strength of 500 men. The re-organisation of the infantry in the other corps has not yet been begun. With regard to the strengthening of the garrison in Crete, in addition to the troops despatched to the island on the 19th of December, 2 battalions were sent over on the 29th of the same month, 3 battalions at Aidin received orders to hold themselves in readiness to embark, and the magistrates of the Aidin township received instructions to purchase 200 mules and other beasts of burden for service in Crete.

Universal military service was adopted in Turkey in 1843, but so many exceptions are allowed that practically only half of the able-bodied young men are trained at all. All the Mahomedans of Constantinople, Pera, and Scutari are exempt, and so are the Kurds of Eastern Asia Minor. Neither is there any obligation on the Arabs or Moslems of the Archipelago, on Albanians, or on the

people of Tripoli. All Christians are exempt, but must, instead, pay a yearly tax of about 3s. 7d. In the standing army (Nizam) the period of service is six years, in the reserve (Redif) eight years, and in the territorial army (Mustafiz) six years. All three categories make up 600,000 infantry in 648 battalions, 50,000 cavalry in 200 squadrons, about the same number of artillerymen with 1,400 guns, and 7,400 engineers in 39 companies. The last include 4 telegraph and 4 torpedo companies.

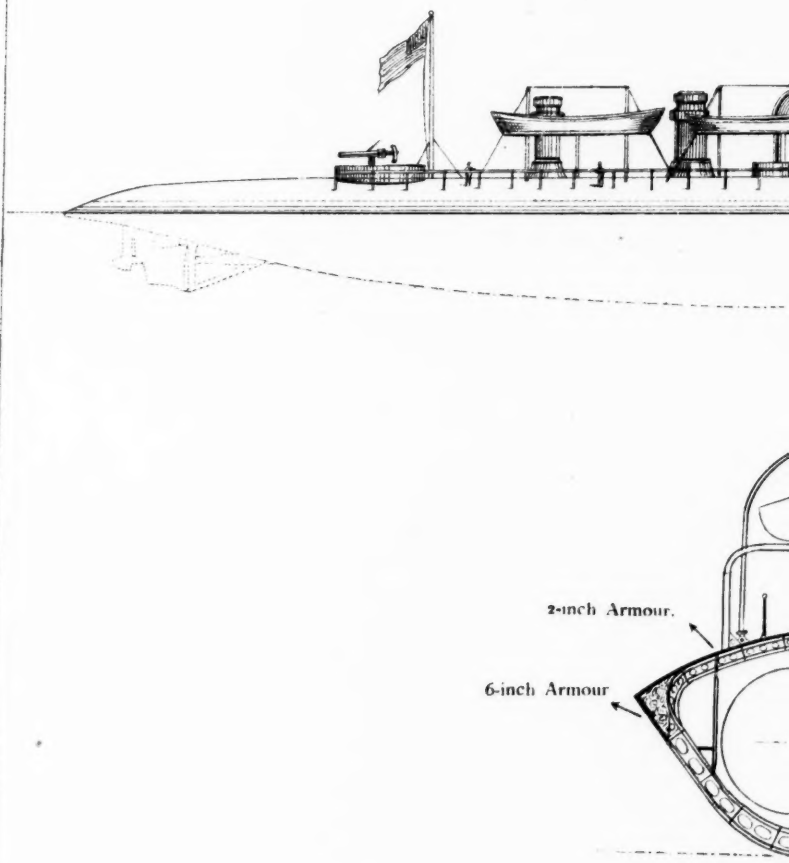
The Turkish Empire is divided into six military districts, each containing 1 active and 2 reserve army-corps. Each army-corps consists of 6 cavalry regiments, 34 battalions, 18 horse and 72 field batteries. The army-corps in Macedonia is decidedly stronger. The regular infantry, which hitherto has carried the Martini-Peabody, is now provided with a magazine rifle; but probably the reserve will have to go on, for the present, with the old weapon. The whole of the artillery are armed with Krupp guns, the cavalry with the Mauser repeating carbine, a sabre and pistol, and one regiment in each division is armed with the lance.—*Militär-Zeitung.*

UNITED STATES.—The Council of the Military Service Institution of the United States have instituted a gold medal, together with $100 and a certificate of Life Membership, to be awarded annually to the writer of the best essay on a military topic of current interest. As is the case in the Royal United Service Institution in England, competitors must be members or eligible for the membership of the Institution. The subject selected for 1896 is:—"The proper military instruction for our officers; the method to be employed, its scope and full development."

The United States is, according to a report on the "Organised Militia of the United States," just issued by the War Department, in a position to put into the field 9,467,694 fighting men, who will furnish the raw material for soldiers. The total organised militia numbered last year 115,669, of which 102,604 composed the infantry arm, 5,215 the cavalry, 5,267 the artillery, 649 special corps, with 1,443 general and staff officers. In many of the States last year camps were held and the attendance upon these occasions ranged from 55 per cent. in Mississippi to 95 per cent. in Vermont, counting 100 per cent. as perfect. It is estimated that mobilisation of the Militia could be effected in the different States and Territories in from three hours in the District of Columbia to seventy-two hours in Oregon, other State organisations assembling between these two periods. It is estimated that in case of necessity Illinois could be relied upon to furnish 852,625 men in the field; Pennsylvania comes next with 771,874, and Ohio third with 650,000. Then comes New York with 560,000, Indiana with 481,192, Kentucky 361,137, Missouri 350,000, Massachusetts 339,391, Wisconsin 306,343, Texas 300,000, Virginia 295,440, New Jersey 284,887, Georgia 264,071, Michigan 260,000, Iowa 245,899, North Carolina 240,000, Mississippi 228,700, Maryland 205,816, Arkansas 205,000, and the remainder of the States below 200,000. In about two-thirds of the States the Militia is armed with the Springfield rifle and carbine of various patterns. In the remaining third there are different varieties in use. The condition of rifles and carbines is far from good. Quite a large number are unserviceable from lack of minor parts, but their rusty condition is the fault most frequently commented upon. A number of the artillery Militia regiments are provided with Gatling guns and 3·2-inch breech-loading rifles, but a large proportion of the artillery armament consists in 12-pounder Napoleons, 3-inch muzzle-loading rifles, Parrott rifles and other obsolete ordnance. The condition of the artillery is worse, if anything, than the infantry.

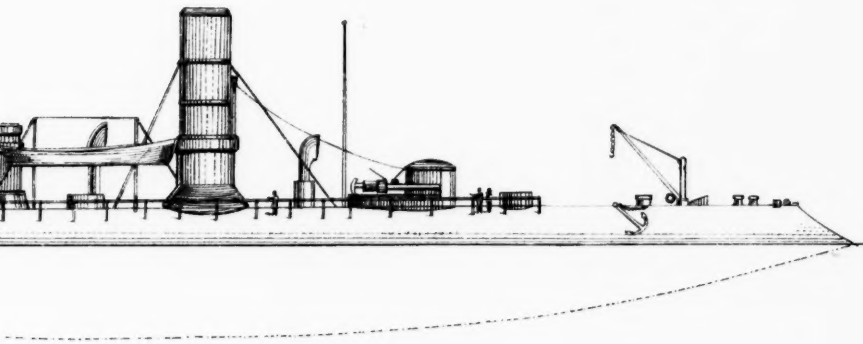
"In more than half the States," the report says concerning equipment, "the equipment may be classed as fair or poor; in the remainder good or very good. If the Militia were called into active service probably the greatest defect would be

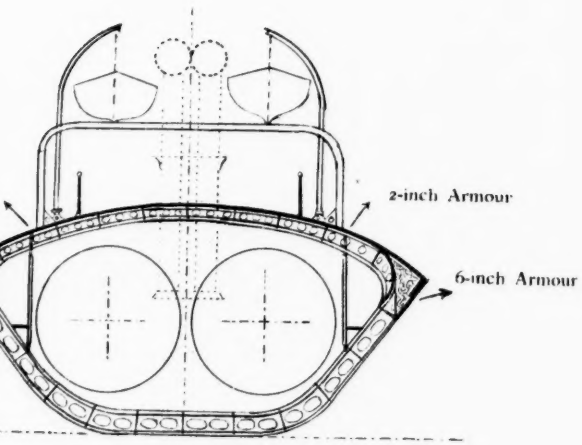
found in equipment, which is incomplete, particularly in those articles which are more needed especially in the field. The artillery harness is generally reported as old and practically worthless." The aggregate of small arms ammunition held in reserve, in addition to that in the hands of the troops, is not far from 3,000,000 rounds. States having Gatling gun batteries keep on hand a limited supply of ammunition for these guns. The supply for field guns is very limited, and the quality by no means the best. As to subsistence, the opinion is advanced in the publication that in all cases during encampments the men were well fed. "On the whole," it says, "the Militia seems to demand, or at least to get, more than the allowance of the Regular Service." The *personnel* appears to be better than the discipline, being regarded as excellent in the majority of States, while discipline is rated as excellent only in six. The men are usually young and anxious to learn. Breaches of discipline and failures to observe the niceties of military etiquette appear to be due largely to ignorance and lack of experience. The arrangement of exercises for regimental encampment which was suggested in last year's publication is reprinted in the new volume. The reports of officers who inspected the National Guards of the various States are included in the publication.—*New York Army and Navy Journal.*



Midship Section and Profile of the new United States Harbour

Ad. of Kellner & Co. Litho. London.





tes Harbour-Defence Armoured Ram. **"Katahdin,"** 2,155 tons, 4,800 I.H.P.

RECORD OF NAVAL AND MILITARY EVENTS.

MARCH, 1896.

1st (S). Abyssinians defeat Italian troops under General Baratieri at Adua or Adowa in Abyssinia.

2nd (M). 1st Royal Dragoons moved from Island Bridge to Portobello Barracks, Dublin.

,, ,, Navy Estimates introduced in House of Commons.

3rd (Tu). Launch of second-class cruiser "Doris" from the works of the Naval Construction and Armaments Company, Barrow.

,, ,, Launch of the "Capitan Muniz Gamero," 30-knot torpedo-boat destroyer from Messrs. Laird's yard at Birkenhead for the Chilian Government.

5th (Th). First-class cruiser "Impérieuse" commissioned as flag-ship for the Pacific.

12th (Th). Egyptian Expedition ordered to the Soudan under the Sirdar, Brigadier General Sir H. H. Kitchener, K.C.B., C.M.G., A.D.C.

,, ,, Vice-Admiral Carlo Racchia, Commander-in-Chief of the Reserve Squadron of the Italian Fleet, died at Spezia on his flag-ship the "Lepanto."

14th (Sat). General H. Peel Yates, C.B., Colonel Commandant, R.A., died at Penzance.

,, ,, Launch of the first-class armoured-cruiser "Carlo Alberto" for the Italian Government at Spezia.

16th (M). Army Estimates introduced in House of Commons.

,, ,, Army Order authorising gratuity to all ranks in recent Ashanti Expedition.

17th (Tu). Unsuccessful attempt to launch the new second-class cruiser "Dido," at the Glasgow Engineering Shipbuilding Company's Yard.

18th (W). Advance Force, Egyptian Army, left Sarras, South of Wady Halfa, for Akasheh.

,, ,, Dervishes repulsed at the Pass of Zabdirat, near Kassala, by Italian Native troops.

20th (F). Advance Force, Egyptian Army, arrived at Akasheh, South of Sarras.

,, ,, 1st Battalion North Staffordshire Regiment left Cairo for Wady Halfa.

,, ,, H.M.S. "Dido" successfully floated.

,, ,, Second-class cruiser "Mercury" paid off at Portsmouth.

23rd (M). Revolt of Natives in Matabeleland, South Africa; British South African Company's Police proceed against.

24th (Tu). Emperor of Austria appointed Colonel-in-Chief, 1st (King's) Dragoon Guards.

26th (Th). 8th Canadian (New Brunswick) Hussars offer their services in the Soudan.

27th (F). New first-class battle-ship "Renown" made a very successful eight hours' natural-draught trial.

28th (Sat). Fighting near Kassala between Italian troops and Dervishes.

,, ,, Launch of the second-class cruiser "D'Assas at St. Nazaire for the French Government.

,, ,, Launch of first-class battle-ship "Iowa" for United States Navy.

30th (M). New first class battle-ship "Mars" floated at Messrs. Laird's, Birkenhead.

31st (Tu). Launch of the first-class battle-ship "Fuji" from Thames Shipbuilding Company's works at Blackwall, for the Japanese Government.

FOREIGN PERIODICALS.

NAVAL.

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March.—"Remarks on the Second Reading of the Military Budget." "A Glance at the Technical and Ballistic Progress in Guns, with reference to the Future of Field Artillery" (*continued*). 11th March.—"In Memoriam:—General of Infantry von Stosch." "The War in Abyssinia." 14th March.—"The Military Crisis in Italy." "The Military Value of Abba-Carima." "A Glance at the Technical and Ballistic Progress in Guns, with reference to the Future of Field Artillery" (*continued*). 18th March.—"The Change in the Italian Ministries of War and Marine." "A Glance at the Technical and Ballistic Progress in Guns, with reference to the Future of Field Artillery" (*continued*). 24th March.—"Could Marshal Bazaine in 1870 save France?" "Experiments with Smokeless Powder at Berlin." 25th March.—"The Life of Field-Marshal Hermann von Boyen." "A Glance at the Technical and Ballistic Progress in Guns, with reference to the Future of Field Artillery" (*continued*). 28th March.—"Why is a Fleet necessary?" "A Glance at the Technical and Ballistic Progress in Guns, with reference to the Future of Field Artillery" (*continued*).

Jahrbücher für die deutsche Armee und Marine. No. 4. Berlin: April, 1896. —Had not been received at time of going to press.

Militär-Wochenblatt. Berlin: 4th March, 1896.—"A Monument to H.R.H. Prince Frederick Charles of Prussia at Metz." "Four or Six Guns?" "General Baron von Kottwitz at the Battle of Loigny." 7th March.—"The Jubilee of Prince George of Saxony's Fiftieth Year of Service." "The Battles of Villiers and Champigny on the 30th November and 2nd December, 1870, as well as the Action at Mesby." "The Russian Expedition into the Assuri-Country in 1894" (with map). "Changes in the Regulations as to War-Allowances of Officers and Military Officials in Russia." 11th March.—"The Military Society of Berlin: Discussion on the Health Report of the Bavarian Army from the 1st April, 1891, to 3rd March, 1893." "On the Acceptance of Volunteers in the Russian Forces." 14th March.—"General of Infantry and Admiral Albrecht von Stosch." "Some Ideas on the Further Development of the Shooting of our Infantry." "Exercises of the Field Artillery in the Provinces, including those for the Autumn Manœuvres." 18th March.—"Some Ideas on the Further Development of the Shooting of our Infantry" (*continued*). "Exercises of the Field Artillery in the Provinces, including those for the Autumn Manœuvres" (*concluded*). 21st March.—"Twenty-five years ago on the 22nd March, 1871." "At St. Hubert on the 18th August, 1870." "Some Ideas on the Further Development of the Shooting of our Infantry" (*continued*). 28th March.—"Soldiers' Clubs." "At St. Hubert on the 18th August, 1870" (*continued*). "Some Ideas on the Further Development of the Shooting of our Infantry" (*continued*).

Neue Militärische Blätter. Berlin: February, 1896.—"Field-Marshal von Benedek, as Soldier, General, and Leader of an Army" (*continued*). "The French Expedition to Madagascar." "The Recruiting and Organisation of the Russian Army" (*concluded*). "Gleams of Light on the Pontus, and especially on the Bulgarian Coast." "On the Value of Autumn Manœuvres." "Five Years under the Tricolor." "Strategic-Tactical Problems." "The Austro-Hungarian Army in relation to the German—its Organisation and the Promotion-Regulations."

ITALY.—*Rivista di Artiglieria e Genio.* Rome: March, 1896.—Had not been received at time of going to press.

SPAIN.—*Revista Técnica de Infantería y Caballería.* Madrid: 1st March, 1896.—"Swiss Military Institution" (*continued*). "An Operation of War." "Some Remarks on Cavalry when Fighting Dismounted." "Episodes of the Insurrection in Cuba." 15th March.—"Swiss Military Institution" (*continued*). "The Military Expeditions to Cuba." "The Wars in the Low Countries: Siege and Capture of Breda, 1624-1625."

SWITZERLAND. — *Revue Militaire Suisse.* Lausanne: 15th March, 1896.— "Reflections on our Military condition" (third and last article), by Colonel C. Favre. "Our Artillery Parks, present and future," by Lieutenant J. Vallotion." "The War in Erythrea" (with a map).

UNITED STATES.—*Journal of the Military Service Institution.* Governor's Island, N.Y.A.: March, 1896.—"A Decennium of Military Progress," by Lieutenant Wisser. "The Balloon in the Civil War," by Captain J. Glassford. "Limitations of the National Guard," by Lieutenant Scherer. "Military Duties in Aid of Civil Power," by Captain Regan. "The Defence of our Frontier," by Colonel Rice. "Instruction of Sea Coast Artillery," by Lieutenant Califf. "Alaskan Notes," by Captain Jocelyn. "Pay for services rendered," by Lieutenant Wood. Reprints and Translations, including Review of Military Technology (translated from the German), and a Lecture on Artillery Material (translated from the French).

The United Service. Philadelphia. March, 1896.—"Did Grouchy by disobedience of Orders cause the Defeat of Napoleon at Waterloo?" by F. L. Hindekoper. "His one brave act," by Lieutenant J. P. Wisser, U.S.A. "The Art of Horsemanship." "Gold" (a drama), by D. G. Adee. "Ironclads in Action," by Lieutenant Van Duzer, U.S.N. "Naval Progress in 1895."

NOTICES OF BOOKS.

Darstellungen aus dem Bayerischen Kriegs- und Heeresgeschichte. Herausgegeben vom K. B. KRIEGSARCHIV. Munich: J. Lindauer (Schöpping). Each Part price 3s.

Part I (1892).

Eine Studie über die Kurfürstliche Pfälzische Armee 1610-1778. Colonel A. ERHARD.

Das Kurbayerische "Prinz Philipp Karabiniers-Regiment zu Pferd" 1704-1710. Captain L. WINKLER.

Die Stellung des II. Bayerischen Armeecorps vor Paris 1870-71. Baron L. von GEBSATTEL.

Part II (1893).

Ein Flussübergang vor 200 Jahren (the Crossing of the "Save" and Capture of Belgrade by Maximilian, Elector of Bavaria, 1688). Lieutenant J. DAUER.

Das K. B. 1st (now 3rd) Chevaulegers-Regiment "Kronprinz" während des Feldzuges 1806-1807 in Polen, Preussen und Pommern. Count YSENBURG-PHILIPPSEICH.

Bayerische Kriegsvorbereitungen, Mobilmachung und Einleitung zum Feldzuge 1809. Lieutenant G. PAULUS.

Rückblicke auf die inneren bayerischen Heeresverhältnisse während des deutsch-französischen Krieges 1870-71. I. Prepared by the Bavarian General Staff.

Part III (1894).

Neerwinden. Eine Umfassungsschlacht aus dem 17 Jahrhundert. Lieutenant J. DAUER.

Die Verteidigung von Thorn vom 20 Januar bis 16 April 1813. Major R. von HÖSSLIN and E. HAGEN.

Rückblicke auf die inneren bayerischen Heeresverhältnisse, etc., 1870-71. Part II.

Part IV (1895).

Der militärische Wassertransport in Kurbayern. Captain K. MÜLLER.

Der bayerische Oberst François de Lacolonie und seine Memoiren 1692-1720. S. HELLMANN.

Aus dem Kriegsleben einer Feldbatterie. Lieutenant-Colonel F. OTTO.

These four volumes, 1892-3-4-5, represent the first-fruits of a long-cherished desire on the part of the Bavarian War Office to bring out a publication of its own for the consideration of historical matter connected with the armies of Bavaria and of the Palatinates. As the signed articles which are to appear will mostly be written by officers serving on the Head-Quarters Staff, and will be based largely on official records, it is evident that a valuable mine of information will thus be opened up to the future military historian; more especially as it is intended that only information shall be published on such subjects as have hitherto either altogether escaped the researches of previous writers or have been insufficiently dealt with from want of reliable material.

History rarely concerns itself with the doings of individual fractions of an army, and in the complicated entanglement which represents the exploits during the seventeenth and eighteenth centuries of the armies serving under the banners of the electors Palatine and of the several dukes and electors of Bavaria, it must be admitted that there is little for the historian to linger on or to fascinate the attention of the general reader; nevertheless, to the military student who looks to first causes and not only to the results, and to whom organisation and detail are all-important factors in arriving at a just appreciation of military events, this period is one of peculiar interest, and the prospect of having a clearer light thrown on so many obscure points will, therefore, be welcome.

The variety of episodes dealt with in the dozen essays or so which now reach us, necessarily only permits of attention being directed to one or two of those which are of more general interest; a sufficient indication of the subject-matter and importance of the others is, however, afforded by their titles.

Die Stellung des II. Bayerischen Armeecorps vor Paris 1870-71.—By the capture of the Moulin de la Tour redoubt and the outlying French entrenchments on the North-Eastern extremity of the plateau of Villacoublay, the IInd Bavarian Corps not only was able to take up on the 19th September a position considerably in advance of that which had been assigned to it in the preliminary scheme of investment, but it also wrested from the hands of the French the key to the forts lying to the South-West of the capital. The front of the position taken up by the Corps, extending from Étang de Chalons on the West to Cachan on the Bièvre on the East, was close on $4\frac{1}{2}$ miles, whilst the line of outposts was rather over $5\frac{1}{2}$ miles (11,000 paces); the Western half of this line was held by the IIIrd Division and the Eastern portion by the IVth Division. The plateau of Châtillon, or more properly speaking, of Villacoublay, held by the IIIrd Division, at its North-Eastern extremity, near the Moulin de la Tour redoubt, dominates the *enceinte* of Paris, distant at its nearest point barely $2\frac{3}{4}$ miles (6,000 paces), by 130 metres; forts Issy Vauves, and Montrouge, distant 2,700 to 5,000 paces, by approximately 80 metres; and the heights of Villejuif, on the extreme East, 7,000 paces distant, by 40 metres. The position was therefore admirably suited for engaging the forts, but the absence during the first three months of the investment of any guns capable of answering the concentrated fire of the heavy metal mounted in the French forts made it impossible for the Bavarians to occupy the crest of the plateau in force. Indeed, during the whole of this time, the corps may be said to have retained its advanced position on sufferance, for, until the arrival of the siege-train and the commencement of the bombardment early in January, its task was necessarily restricted to that of defending the vantage ground it had so opportunely seized. If, however, the possession of the plateau was of little use for offensive purposes during the earlier months, it yet proved of inestimable value in keeping a close watch on the movements of the enemy and in giving timely warning of projected sorties against Châtillon, Clamart, or Bagneux.

The sharp look-out kept up at the two observatories of Moulin de la Tour and the Tour des Anglais, on the plateau itself, and at the one established at the Château Treviso in Sceaux, unquestionably contributed very materially to the defence and retention of the Bavarian position, for, in consequence of the heavy fire poured in by the forts on the slightest sign of movement in the investing lines, it was not possible for the main body, or even for the supports, to take up close positions in reserve; moreover, the ground in rear of the Bavarian front was, from its wooded and enclosed character and the paucity of roads, unfavourable to the speedy concentration and forward movement of large bodies of troops; this inconvenience was still further accentuated by the many defensive obstructions organised in the intermediate zone. A rapid advance in support of troops who might be surprised in the front was, therefore, well-nigh impossible; but, thanks to the timely warning given from the observatories, sufficient notice was always received to allow of the offensive defence being organised.

The wide extent of matter dealt with by the German official account of the war accounts possibly for the absence of details connected with the minor operations and difficulties of the siege, and for a brief reference only being made to the position of the IInd Bavarian Corps before Paris. These details, which would perhaps have been out of place in the general work, are now opportunely supplied by Baron von Gebsattel, and, without his unduly emphasising the fact, it is easy to see that the privations and hardships of the siege were not entirely restricted to the French, but that they were shared by the besiegers in almost equal measure with the besieged. The clean sweep of all available supplies of food and forage in the immediate vicinity of Paris made before the arrival of the Germans necessarily left little to be obtained by requisition. During the first weeks of the investment, therefore, and until regular supplies began to reach the front, the troops suffered considerably from want of food; indeed, it was not until the latter part of November that beef and sugar ceased to be considered as luxuries. There was also great want of shelter for the troops engaged in the front during the whole of the inclement autumn and the severely protracted winter. In the IIIrd Division especially the accommodation was very defective, and most of the infantry piquets and supports were cramped up in the dark, low and ill-ventilated earth lodgments. In the wet autumn weather the ground occupied by the outposts became a veritable swamp, the mud being so deep and tenacious in places that it pulled the men's boots off. During their four days' turn on outpost no opportunity could be obtained by the men for drying their sodden clothes, whilst the heavy and continuous fire poured in from the forts at any sign of movement necessitated the greatest precautions being observed in relieving the posts or even individual men: many of the vedettes, after taking up their posts early in the morning, could not be moved before dark. In some places, notably at Clamart, men had to stand for hours at a time on a ladder to watch the enemy over a wall or other shelter; at others, after crawling to their posts, the sentries were obliged to remain prone and motionless in the mud and rain all day long. Nevertheless, in spite of exposure to the weather and other hardships, the health of the IInd Bavarian Corps was fairly satisfactory, whilst the losses suffered by shell fire and in action before Paris were surprisingly small considering the prodigal expenditure of the French forts. At Bagneux, for instance, as many as 300 shells frequently fell in a day. During the whole siege the corps lost twenty officers, 701 men, and forty-five horses killed, wounded, and missing, but to this total must be added a further loss of two officers and sixty-six men who died subsequently. The killed numbered six officers and 101 men; the wounded, twelve officers and 510 men; prisoners and missing two officers and ninety men.

The details given by Baron von Gebsattel as to the organisation and position of the piquets, reserves, etc., and as to the arrangements made for the defence of the Bavarian lines, are very full. If any lack occurs, it is in the absence of more detailed sanitary statistics, and in the want of returns showing the numbers invalided home. With the addition of a few lines on these points, and a table showing the actual strength of the corps before Paris, and of the reinforcements received, the work would have been complete.

Rückblicke auf die inneren bayerischen Heeresverhältnisse während des deutsch-französischen Krieges 1870-1.—The information contained in these two essays, which have been prepared by the Bavarian Staff, comprise full particulars on the following points:—

1. Preparations for, and organisation of, the victualling of the army in the field.
2. Preparations for, and organisation of, the supply of ammunition.
3. Remount statistics.
4. Organisation and state of affairs at home:—
   a. Garrison troops, Ersatz troops, and Landwehr Battalions.
   b. Fortresses: Landau, Germersheim, Ingolstadt, and Neu-Ulm.

c. New formations: Infantry, cavalry, artillery, engineers, and field hospitals.

d. Statistics and distribution of prisoners.

5. Statistics of the number of officers and men under arms during the war.

This summary shows sufficiently the value of the information to be looked for, so that it is unnecessary to do more than note a few particulars.

2. As regards ammunition, it appears that the 36 batteries belonging to the two Bavarian Corps expended during the war a total of 57,800 rounds; the maximum expenditure for a 6-gun battery having been 4,500 rounds, and the minimum for a 4-gun battery 140 rounds. The mean expenditure per gun in the Ist Corps was 412 rounds, and in the IInd Corps 105 rounds. The guns of the Ist Corps were in action 168 days, those of the IInd Corps 48 days; the mean expenditure per day in the Ist Corps was, therefore, 279 rounds, and in the IInd Corps 224 rounds. The expenditure of rifle cartridges was 3,654,000.

3. At the outbreak of the war there were required:—(*a*) To place the Field Army on a war footing 2,324 saddle horses and 8,640 draft horses, or a total of 10,964. (*b*) For the Ersatz and home requirements, 3,680 horses. During the course of the war the further requirements were:—(*c*) To replace casualties in the field, 5,356; (*d*) do., do.; made up by capture or requisition in France, 3,019, or a total for (*c*) and (*d*) of 8,375 horses.

Exclusive of officers' chargers, the establishment of horses during the campaign was, therefore, as follows:—

	Peace establishment		8,546
a. b.	Bought for mobilisation	14,644	
c.	Bought to replace casualties in the field ...	5,356	
			20,000
d.	Captured and requisitioned in France		3,019
	Total		31,565

4 *d*. The total number of French prisoners interned in Bavaria, excluding officers, was 40,224, of whom 684 died and 56 escaped.

5. The following table shows the number of officers, men, and officials, mobilised during the war:—

a. Who crossed the French frontier before 2nd March, 1871.			*b.* Attached to the Home Army.		
Officers.	Men.	Officials.	Officers.	Men.	Officials.
3,325	130,902	517[1]	845	44,004	507
	134,744			45,356	
		180,100[1]			

Aus dem Kriegsleben einer Feldbatterie.—The VIth 6-pounder Field Battery of the 4th Artillery Regiment "König," whose experiences are related in this article, formed part of the IVth Infantry Division of the IInd Bavarian Corps, forming the advanced guard of the IIIrd German Army under the Crown Prince. It had the good fortune to be the first German battery to come into action on French soil, opening fire within 700-800 metres of the walls of Wissembourg, at 8.30 a.m., on the 4th August, Here it was subjected to rather a severe handling from the French infantry, and suffered a loss in two hours of eight officers and men and fifteen horses killed and wounded. After Wissembourg, the battery was continuously on the march until the 17th August, when it halted with the IIIrd Army to await the result of the actions round Metz. On the 18th August, the march on Châlons was resumed; but on receipt of the news of MacMahon's attempted movement to the relief

[1] In addition to this number, 797 civilians crossed the frontier as chaplains, post, telegraph, and railway *employés*, etc.

of Bazaine, the direction was altered towards Sedan. At Bazeilles the battery, with two others, was sent to assist the artillery of the Ist Corps, and came into action for a short time on the height West of Aillicourt. At 9.30 a.m., on the 1st September it engaged two 16-pounder and one 24-pounder French guns mounted in one of the Eastern bastions of Sedan, thereby drawing off their fire from the IIIrd Bavarian Infantry Division. Between 10 and 11 a.m., it engaged two field batteries posted on the height North of Balan, and compelled them to withdraw. It then again drew off the fire of the guns of the fortress up till noon, when it seems to have had no further opportunity of taking an active part in the battle. Up to noon the expenditure was 248 rounds, and the casualties four men and four horses. On the 4th September, the march on Paris was commenced, and on the 21st September, the battery went into cantonments at Sceaux, where it remained until 9th March, 1871. At the fight of Bagneux, 13th October, the battery did good service, as may seen from the German official account; and again at L'Hay on 29th November, where, with two other Bavarian batteries, it succeeded in drawing off the French artillery fire, and by directing a flanking fire on the French sortie, it materially aided the Vîth German Corps in defending and regaining the position. In the bombardment from the 5th to the 26th January, 1871, the battery was principally subjected to the fire of forts Bicêtre and Montrouge and of a battery at Arcueil; but it suffered no losses. After forming part of the army of occupation for three months, the battery, on 3rd June, commenced its return march, and re-crossed the frontier on 3rd July, 1871. During the whole campaign, the VIth Battery was in action on twenty-four days, fired 1,123 rounds, and lost two men killed, one officer and ten men wounded, and twenty-nine horses killed and wounded.

Cavalry Drill, 1896. (Two Vols.) By Authority.

The new Cavalry Drill Book is, as might have been expected, a distinct improvement on its predecessor. That it is comprised in two volumes instead of three is in itself a commendation, and indulges the hope that in course of time its further condensation may be possible.

It is to a certain extent regrettable that officers should be referred to the Artillery Drill (which by the bye is still out of print), for it may be fairly claimed that the Cavalry Drill Book should contain a complete digest of the various duties that pertain to cavalry. The difficulty presumably lies in the indispensability of brevity and portability in a book of this kind.

Vol. I. is on the whole excellent, though a few points require to be alluded to.

In the instruction of the recruit, it very properly states, on page 4, that the first object is to give him confidence and a good seat; but it lays down regulations in a sequence which, in the opinion of many, is that *least* calculated to inspire confidence in the raw recruit. Under this system he is to mount his horse without stirrups on a slippery numnah, and he is not to hang on to the reins. But why not, in the interests of common sense, allow him to mount at first with stirrups and wallets on the saddle, clutching them to his heart's content? Given a quiet horse he will very soon gain confidence and balance, will be proud to ride without his stirrups, and will have learnt not to hang on to the bridle as his only friend.

Another time-honoured stumbling block presents itself in Sec. 17, para. 5, page 24.—Riding with all four reins :—"The right bridoon rein is placed across the left hand the reverse way of the left bridoon rein, and the left thumb closes firmly on all four reins." Why is the soldier forbidden to hold his reins in the manner that every officer and every hunting man holds them when riding across country? The system is another of the relics of barbarism handed down from previous drill books.

Rising in the stirrups is now acknowledged to conduce to the ease of both man and horse (Sec. 17, para. 7, page 24, Vol. I.); and men *are* to ride with the feet rammed home in the stirrups when jumping (Sec. 16, page 46, Vol. II.). These innovations will be generally accepted as progressive steps in the direction of good horsemanship. It is to be hoped that others will shortly follow.

There appears to be a slight omission in the words of command on page 44, Part I. After Sword Exercise, "Go large" should surely be "Eyes left, go large." It is a small matter, certainly; but if performed as laid down in the book, it would result in No. 4 leading the ride on the right rein, instead of No. 1 on the left. Drill books should be accurate in the smallest detail.

It is to be regretted that in the General Directions for the Carbine Exercise, in Sec. 40, page 159, Vol. I., the new carbine should not have been dealt with here, instead of the old Martini-Henry. Indeed, portion of this section is already obsolete.

In the instructions for swimming horses, Sec. 50, para. 6, page 76, Vol. I., it is laid down, after leading the horse by the bridoon into the water, that "the longe will then be attached to the right bridoon ring," etc. This is not in accordance with the system which has been found to work best in foreign armies, in which it is customary to pass the rope through both rings of the bridoon and keep hold of both ends from the boat; the horse can thus be set free when half way across the river. Of course, the rope must be such as will run free through the bridoon rings. This system certainly saves time, is the safest, and has been practised by cavalry in England with good results.

The march past in slow time has been abolished. Few will be found to regret it, survival as it was of the old days when cavalry were trained to fight on foot as infantry. But it is of no greater utility for purposes of modern war than is the Chinese war dance drill of somersaults to terrify the foe.

In regard to Vol. II. there is little, if anything, to criticise. It is eminently sensible and practical, and is much condensed from the old book. Though there are a few additions, much is omitted which can well be spared; while such alterations as have been made are distinctly good, for where detail is omitted allowance is made for the intelligence of the British cavalry.

There is, fortunately, not much that has to be "unlearnt" and learnt again. Files have replaced half sections, though half-sections have by no means disappeared. They are continually mentioned in the Ceremonial Duties, Guards, Escorts, etc.; indeed, the only mention of files that can be found is on page 282, where it is laid down that "cavalry employed in lining streets will be marched in files or half-sections." Again, on page 4 it is laid down that a half-section means two files, so that it is evidently intended that this formation shall still be practised, though the details are conspicuous by their absence.

There has been for some time a growing idea that fours might be advantageously abolished, and the wheel of half-troops used instead. It would simplify the drill, and with troops of twelve or sixteen files would answer just as well. Surely the object of all our drill is to get into the right place by the nearest and simplest manner. The British cavalry would appear to be behind that of foreign countries in this respect.

In Sec. 2, page 7, amongst the Terms of Formation and Manœuvre, countermarching is described, but no details of instructions for the performance of the movement are to be found.

On page 8 a few lines are now considered sufficient to describe the duties of combat patrols, instead of a whole section as in the old book. This is, no doubt, a compliment to the common sense of the cavalry soldier.

There are other new features in the book: All troop leaders are to lead on the same object when it can be seen from a distance (page 70).

Page 8: The interval of open files is to be 2 yards instead of 1.

Page 9: The interval between squadrons is 8 yards instead of 12 yards.

Page 24: Dressing is *not* to be obtained by men looking to the centre or other directing point in the rank.

Page 25: Men are to ride with correct intervals from knee to knee, looking straight to their front.

Page 30: There is a useful diagram illustrating a moving pivot.

Page 53: The functions of the second in command of the squadron are briefly described. He is to help the squadron leader as much as possible. His further duties are, in case of retreat, to conduct it with the aid of the serrefiles (page 62). He is responsible for the sending out of combat patrols (page 191), and in dismounted service he is to take charge of the led horses (page 214).

Half-squadrons may be formed by the second and fourth troops moving up alongside of the first and third (page 55).

It is a pity that space will not admit of more illustrations by diagram accompanying Sec. 26, which gives the evolutions to be practised by the regiment. However unnecessary they may be to the finished dragoon, they are useful to beginners in their endeavour to master the rudiments of drill. The diagrams in Vol. II. of the old book will be missed, as well as the maps at the end of Vol. III. of the old book which illustrated reconnaissance duties. They were valuable guides for those young officers and non-commissioned officers who took the pains to work them out.

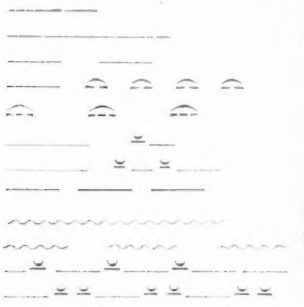
It is to be regretted that "The Contact Squadron," a most useful book, has been permitted to go out of print. It is probably the most instructive and most interesting work of its kind, and one with which every cavalry officer and N.C.O. should be acquainted.

Little fault can be found with Sec. 33 (page 202), which deals with machine-guns, though no mention is made of the ground scouts necessary, nor of the number of men required to accompany the gun, nor any instructions given for their guidance. True, it is all a matter of common sense, but machine-guns without scouts are of no use at all; a little detail on the subject would be of advantage.

Sec. 34 (page 205), on mounted infantry is new and to the point, and no one will cavil at the reference here made to "Regulations for Mounted Infantry, 1895." In Part III., Ceremonial (page 241), dealing with Guards, Escorts, etc., has been abbreviated and simplified with good results.

The remainder of the book devoted to Manœuvre (Part II.) is eminently satisfactory. Detached duties, information, protection at the halt and on the march, cavalry on the field of battle, dismounted service, and miscellaneous duties are well thought out, well expressed, and form most interesting reading for those who care to study the duties of cavalry in the field. The regulations for squadron training given in Sec. 7, page 231, are a welcome addition. And the practical wisdom of dividing it into a summer and winter course, together with the special training of patrol leaders, will commend itself to those concerned. The reference to pages instead of paragraphs and sections is an unmitigated blessing. The addition of the field bugle-calls would be useful, and would not take up much room if printed small. A call for pioneers and one for the machine-gun might well be added. Whistles are to be used by squadron leaders (page 2 and page 16) to attract attention before giving a signal which may on occasions be necessary; but if any object is to be gained by silent drill, the whistle will not conduce to it, and men should certainly be trained to work occasionally in absolute silence. No whistle sounds have as yet been authorised, except one call for attention. Perhaps a succession of short notes would be a useful call for rally, "⌣ ⌣ ⌣ ⌣ ⌣ ⌣ ⌣ ⌣," and a whistle sound of any kind while firing should

mean "Cease Firing," and nothing else. Although the Germans, Austrians, and Russians do not appear to have introduced the whistle in their cavalry, the French have a complete code, consisting of long and short notes as follows:—



The table of contents is well drawn up, but a short index to Vol. II., such as the following, would be found useful:—

INDEX TO VOL II.

The new book may be said to provide the cavalry leader with a sound and useful guide. It leaves much to his discretion, and the results will surely show that he is capable of rising to the occasion. The cavalry of Great Britain can well hold its own with that of any European nation. The material is unequalled, and the drill leaves little to be desired. But if it is denied adequate ground to drill on, is not allowed to trespass off the roads, is seldom brigaded together, often broken up in detachments, given no opportunity of efficiently and thoroughly learning its work, except in theory, it cannot be expected to successfully cope with the cavalries of Austria and Germany, which have long enjoyed all these advantages, and been trained to the highest degree. It must not be forgotten that in every foreign army an ordinary squadron outnumbers a British squadron by thirty or forty men; and though the British cavalry in pluck and material

is still second to none, and though it possesses men of the first rank to lead it, it cannot be expected to succeed, unless it is granted opportunities equal to those of the cavalry of other nations. This cannot be said to be the case at present.

La Situazione Militare Mediterranea. By D. BONAMICO. Published in the *Rivista Marittima*, June to December, 1895.

This exhaustive treatise of nearly 300 pages of small type might be said to deal with the whole military question as affecting the nations of Europe generally, rather than their purely Mediterranean interests, although it may be granted that it is around the shores of the Mediterranean that national envy, jealousy and suspicion are most likely to bear their bitter fruit. The author observes that the military position has assumed a new feature, a regrettable fatality having forced France into an anti-European policy which is a grave and persistent menace to the peace of Europe, and morally, if not materially, fatal to herself. The threatening attitude of Russia is likened to that of the early Ottoman Empire, the fleet of Alexander III. to that of Suliman II. Although in the eyes of Europe the parallel may not hold, she is menaced to-day with an Oriental invasion similar to that of the Mussulman, the only difference being that the former if latent is of vastly greater import. The part that America may play in the future development of European civilisation is considered at length, the argument being to show that if Europe is threatened on the Continent by the Slav, she is in the future equally so on the seas by America—represented by the United States. It is, however, permissible to hold that Europe, when once aware of the first symptoms of the application of this Continental and Maritime Slavo-American compress, will know how to provide resolutely for her safety, and to keep the rending pressure within reasonable limits. Chapter III. analyses the military power of the different European nations in relation to each other, and many points of interest are brought out; a great deal being made of what the author terms national solidity, which consists of unity of thought and purpose or international compactness: another name for patriotism, as we understand it, concentrated on a single aim. The weakening effect of dualism is fully considered in its application to France, where neither the military nor naval element preponderates, both forming equally important parts of her organism, the dual system being more fully carried out than in any other European nation, not excepting Italy herself.

Voluminous statistics are given showing the relative military and maritime forces of the different nations under consideration, and are worth careful study, although it would be beyond the scope of the present notice to criticise them. The hypothesis of a conflict between the double and triple alliances is believed possible, if not probable, with the whole of Europe between the 35th and 60th degrees of longitude as an immense theatre of operations, land and maritime. These operations are fully considered in their strategical details, assuming that Denmark would join hands with the double alliance, thus affording an efficient and secure base for both land and sea forces operating against Germany, from the Vistula to the Rhine. Amongst the causes which may, and perhaps ought to, modify the conditions of European instability thus sketched are in order of efficiency and importance the definite intervention of England, Turkey, or Spain. An analysis of the situation as regards the British Empire is entered into in all its forms—external, colonial, military, and political, as the author says, *ex abrupto*—in order to exclude any doubt in the nature and intensity of the sentiments which we personally attribute to "John Bull." The faith of the majority in Italy in the possibility of an Anglo-Italian alliance is characterised as puerile, and the assertion of the author of "Guerres Navales de demain," who, in a recent article, said: "If at any time Russia should put herself into line with us, that very day, *ipso facto*, England will range herself effectively on the side of the triple alliance," is equally unfounded. The disadvantages to Italy of the Anglo-Italian alliance

would be, that it would force her eventually further into a colonial expansion incompatible with her political, economical, and military condition; would put her into a false position destitute of any national base, financially disastrous, militarily subject, colonially most vulnerable, naturally and defensively inferior to that which she enjoys under the triple alliance. Laird Clowes, Clarke, Colomb, Mahan, and Spencer Wilkinson are amongst the writers on the British position whom the author examines and criticises, observing that what appears clear from the controversy is: 1. That the nation, feeling itself perturbed and insecure in political aim, is desirous of consolidating her position externally in harmony with the new conditions of the European situation. 2. That the system of absolute independence is warmly supported by the naval and commercial interests, and has for its expositors, although differing in their methods, Admiral P. Colomb and Mr. Laird Clowes.

The whole colonial position of England is thoughtfully considered, is well worth careful study, and will, at any rate to some extent, "the giftee gie us to see oursels as ithers see us"—a quality generally, and perhaps mercifully, absent in both Englishmen and Scotchmen. "*L'Inde sera-t-elle anglaise ou russe?*" asked De Beyliè, whilst we well know what he wished to know was, "*L'Inde sera-t-elle française?*" It is here stated that the welfare of England as regards its colonial dominion, and that of Europe as regards its preponderance in the perfection and expansion of its civilisation, turns on the axis of the triple alliance as does the planetary system on the sun, and the vital questions are: Is Egypt indispensable or not to the security of India? Is India indispensable or not to the safety of England? Is, or is not, the colonial dominion of England indispensable to the safety of Europe and its civilisation? Much more might be profitably extracted from this treatise, but enough has been said to show the general drift of the writer's arguments, and he deserves credit for his endeavour to discuss the whole of his complicated subject from every point of view and in a thoroughly impartial manner, as also to put his conclusions tersely and logically before the reader. One of the most important general conclusions on the whole matter, page 235, is that a European solidity necessary and sufficient to preserve the present situation from grave disaster and to form a more stable condition of things in the future, can only and *must be* obtained by the adhesion of England to the triple alliance. The task set for this new quadruple alliance to perform in Europe is rather a grand one, and it is pointed out that we need be under no delusion that the great and lasting benefits to be derived from it will be obtained without resorting to the arbitrament of force; but this, however, does not exclude the hope that serious consequences may be avoided or greatly attenuated, from the fact that the pressure exerted will derive most of its energy from the moral force implied in the military sanction of Europe. The principal aims of this tetrarchy as regards Europe internally would be:—

1. The rectification of the Eastern boundaries of Austria and Germany, so as to assure to Europe the greatest security against the expansions of Slavism.
2. The creation of a Naval European Power in the Black Sea.
3. The resolution of the Danube-Balkan question.
4. The exclusion of the Ottoman dominion from Europe.
5. To secure the integrity of Greece.
6. The integrity of Italy.
7. The unification of Iberia.
8. The resolution of the Danish question.
9. Of the temporal sovereignty of the Pope.

Its aims as regards questions not of a purely European character would be:—

1. The maintenance of economic supremacy.
2. The security of the present colonial dominions.

3. Restriction of the growth of these dominions within the limits of the natural European powers of expansion.
4. Construction of the necessary military power to carry out the programme above indicated.

We have endeavoured to give a *résumé* of the chief points of interest in the author's arguments, and to formulate as well as may be in a few extracts the consistent plan we imagine to have been in his mind whilst preparing them. We must confess, however, to the impression left on our minds when laying down the book that the writer had laboured hard to set up an ingenious array of facts and theories in order to have the pleasure of knocking them over by another array still harder and more ingenious. Much of this impression, however, may be due to the difficulty always present to some extent of setting oneself exactly parallel with the ideas and conceptions of a writer in a language not one's own.

T. J. H.

Works by the same author:—

Elements of Maritime War, 4 lire. *Maritime Defences of Italy,* 5 lire. *Considerations on the Defence of the State,* 3 lire. *Studies on Military-Maritime Geography,* 3 lire. *Economical Speed,* 2 lire.

We have received the first number of *L'Osservatore Navale,* a monthly periodical, published by Salvatore Bizzarrilli, Palermo, which is likely to be a useful epitome of naval news, collated from different sources, with original articles on topics of general naval interest, political and scientific.

The Soldier in Battle, or Life in the Ranks of the Army of the Potomac. By FRANK WILHESON, a survivor of Grant's last campaign. London: Bellairs and Co., 1896. Price, 2s. 6d.

This is a work of altogether exceptional interest to the student of military history and tactics. Hitherto the literature connected with the struggle between North and South, though quite sufficiently voluminous, has proved a most dreary waste for the inquirer, because the published works were mostly controversial in character, and written for men who, having been themselves engaged in the struggle, knew the precise value to be attached to the words used, and who passed over the interior conditions of the troops engaged as common knowledge to all concerned.

American military literature is not singular in this respect: until within the last few years almost all military history sinned in the same direction and to the same extent, and it is to this that the extreme distaste which has existed so long—especially in England—to the study of these books is directly attributable. For the average British subaltern is, above all things, practical, and he refuses to see anything interesting or instructive in the discussion of the possibilities of unknown factors. His common sense tells him that the chief factor in victory or defeat is the fighting grit of the men and officers engaged, and to enlist his attention you must be able to tell him how it happened that at a given time and place one side or the other fought the hardest. This is precisely what the author of these pages has succeeded in doing, and in the most brilliant manner. Without bothering the reader with details why Grant marched to one place rather than another, he paints a most vivid picture of the internal condition of the men who marched, and how it happened that sometimes they succeeded and at others failed.

During 1864, the year with which this little work deals, the Armies of the North were failing fast. Voluntary enlistment had completely broken down, and to keep the ranks filled, it was necessary to resort to conscription. Like the French Republic before them, but unlike the Prussian Monarchy in 1813, the North failed to appreciate the true strength of the measure employed, and in a weak moment allowed *paid substitutes.* Even this did not pass into law without a

most serious outbreak of mob violence in New York, only quelled by a week's street fighting, in which some 15,000 were killed or wounded; but no sooner had it been strictly enforced, than there sprang up the most appalling traffic in human flesh that ever existed. The slave trade the North was fighting to put down was a kid-glove proceeding compared to this. Bureaus were opened throughout the Eastern States, where the very scum of the country were kidnapped, cajoled, and bribed into becoming the substitutes of the refined "aristocracy," who felt themselves too good for the brutal work of a soldier, and what these substitutes were when once handed over to the care of the military authorities the pages of this work tell us.

The military authorities are not to blame in the least; they had to deliver over the tale of men received, and they had at least to endeavour to keep some kind of discipline amongst them. Hundreds belonged to the class for whom our own clause, *re* "desertion and fraudulent re-enlistment" is intended, "bounty jumpers" was the term applied to them, and to keep these men in the sternest possible kind of punishment was requisite. If on the march a man broke the ranks, no one tried to capture him alive—they simply shot him down; and being first-class shots rarely missed, and the bodies were left lying in the road "*pour encourager les autres.*" Needless to say, that even when they did reach the front, they did not do much fighting; as far as possible their well-known propensity to skulk was met by a line of military police in rear of the battle-field, with orders to stop, and if necessary shoot, all unwounded stragglers who attempted to break back; but even this stringent measure did not always suffice, and their presence in the ranks was a source of annoyance and hindrance to everyone.

The author had enlisted under sheer patriotic impulse as a boy of sixteen, and his first experiences of military life were gained amongst this rabble. What he went through must be read to be realised, and all honour is due to him for his pluck and endurance. Once he reached the front, and was recognised as of a different stamp, his lines were cast in pleasanter places. He was posted to a smart battery of light artillery, all of them "enlisted men," *i.e.*, volunteers for the war, and the older soldiers took him in hand and soon made a man of him. Yet even here discipline was singularly lax and yet severe. Punishments were frequent and, English officers will probably consider, were far more cruel and degrading than anything in use in our own Service since the days of Marlborough. Opinions may differ, but crucifixion on the wheel, tying a man up by his thumbs and gagging him, seem more atrocious than a clear six dozen on the triangles.

The Army appears to have fought itself, without much regard to its officers, and nothing is more striking than the instances given of the marvellous adaptability and readiness of resource the men, taken individually, showed; and if they distrusted their officers in the mass, the evidence the author places before us reveals reasonable justification for their conduct. For the book is in the main a record of unsuccessful frontal assaults, and in every instance the cause of failure is directly traceable to that absence of timely support to the attacking line, without which no assault can ever hope to succeed. F. N. M.

Royal Navy Handbook Series.—Naval Administration. By Admiral Sir R. VESEY HAMILTON, G.C.B. Edited by Commander C. N. ROBINSON, R.N. London: George Bell and Sons, 1896. Price, 5s.

This is the first volume of a series of handbooks, written mainly for the benefit of the general public, with a view of enabling the many persons unconnected with the Navy, but who yet take an interest in naval matters, to gain a good general knowledge of all the different branches, administrative and otherwise, which go to form that great Service on the efficiency of which the safety of the Empire depends

But Sir Vesey Hamilton's little work is much more than a volume of instruction for the "man in the street." It is the first attempt which has been made to trace the history of the development of the great department of the State, under which our naval ascendency in the past was won, and which is responsible to-day that that same ascendency at all costs shall be maintained; and there is no doubt that the book will be very widely read and studied. The author himself does not consider the machinery of the Admiralty perfect, but he is of opinion, apparently, that where it has been open to criticism it has been due to administrative acts of individuals, and that (to quote his own words) "the system itself embodies high advantages, such as are possessed by no other department of the State, they are merits that have won the admiration of the Royal Commission on Civil Establishments, and generally of the Hartington Commission and of many statesmen."

The official title of the Admiralty is, "The Commissioners for executing the office of High Admiral of the United Kingdom and of the territories thereunto belonging, and of High Admiral of the Colonies and other dominions," and it appears that the first Lord High Admiral was appointed as far back as 1406; this was John Beaufort, Earl of Somerset, and the office with increasing powers was held by a succession of distinguished men until 1628; since when, except for an interval in the reigns of Anne and George IV., the office has been in commission, as it is at the present time. It was in Henry VIII.'s reign that the Admiralty and Navy Board were established, the naval business of the country having so far increased as to call for the expansion of the administrative machinery; the Navy Board being organised to take charge of the civil administration under the Admiralty, while the directive and executive duties of the Lord High Admiral remained with the Admiralty Office. It is interesting to learn that the Patent of the Admiralty of the present day is practically identical with that issued by Queen Anne, and that there has been but little change in the form since the first one was granted by Henry VI. to the Earl of Warwick.

The larger portion of the book is taken up, naturally, by a description of the existing organisation and distribution of duties among the different heads of departments at present; and it only remains to say that the author has given us a work, which is well worth studying, and is full of information which will interest naval officers to the full as much as the general public. It should also be mentioned that there are some interesting portraits and woodcuts.

Mechanism of Men-of-War. By R. C. OLDKNOW, R.N. Price, 5s.

This is the second of the Royal Navy Handbooks, edited by Commander C. N. Robinson, R.N., and it well maintains the reputation established by the first. As the author says in his introductory note, "the work must necessarily be more or less of a compilation, but none the less the personal element must make itself felt throughout"; and it was no small task which the author had to accomplish, namely, to divest an essentially technical subject as far as possible of its technicalities and make it interesting to the general reader. One inevitable result of this limitation is to make the work of less interest to the naval or professional reader than it otherwise would be, as he will find nothing new in it if he has kept himself abreast of the developments in modern engineering practice. No doubt technical readers will find some of the opinions expressed on past and current engineering practice open to argument, not excepting Mr. Martin's dissertation on the relative merits of "induced" and "forced" draught, which can only now be considered on its trial. It is just stated in the daily press, that the "Majestic," fitted with forced draught, beat the "Magnificent" with induced draught, by 24 miles, or one mile an hour, on her recent full-power trial in the Channel; how far this was due to the boiler draught is not stated. In common with most writers who comment on Admiralty practice, the late engineering

department comes in for severe censure for introducing forced draught, etc., and attempting to "put a quart of peas into a pint pot"; but all these critics appear to forget that great credit is due to the engineering department of that date for the bold departure that was made from former practice in the introduction of small and light engines with high speed of revolution and greatly improved design; and also for the amount of success that was actually attained in getting the quart of peas stowed away into a greatly reduced space. The only fault with which the Admiralty can be fairly charged is that rather too much was attempted at once, but the nett result is that we are years ahead of where we should have been had it not been attempted. Critics are not wanting who assert that the same fault is being committed now, but the truth is that a certain amount of risk must be accepted if advances are to be made; a *sure and certain* policy would leave us hopelessly in the rear. The book is liberally illustrated with well-executed line drawings and photographic reproductions of all types of engines and boilers fitted, or about to be fitted, in H.M. Navy, and the development of the steam department is followed up consecutively from its commencement. In this the author s large and varied experience stands him in good stead, and many wiH wish that he had had a free hand, so that he might have enlarged on *life as it was* for the steam branch in those early wooden steam and sailing line-of-battle-ships. In conclusion, although the book is to a large extent outside criticism, for the reasons stated above, we consider that its production will enhance the reputation of its well-known and highly-esteemed author, and form a useful and valuable addition to general naval literature. There are a few minor corrections to be made in a new issue, notably the engines illustrated opposite p. 110 for "Archer" class, which, as the author states in the text, are horizontal engines, whereas the engines illustrated are vertical; p. 11 it is stated that the "Captain" capsized on the night of October 6th, 1870—the date, to the best of my belief, being September 7th, 1870. The book is of a very handy and portable form, is printed on good paper, and well got up throughout.

A Short History of the 5th Regiment, United States Artillery. By First Lieutenant J. C. BUSH, 5th Artillery. 1895.

This is one of a series of historical sketches of the different corps of the United States Army, prepared for the *Journal of the Military Service Institution.* It has had to be compressed to suit the requirements of the Institution, but in its compressed state it is an interesting record of a regiment, raised in 1861, which took part in no fewer than 108 engagements in the Civil War.

Errata in March Number of Journal

Page 246, lines 19, 23, for *machines* read *hachures*.

Page 324, line 22, for 43 read 26.

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